



Scale: 5" / 100'
Measured Depth Log

Well Name Rio LC 12-369HNX

Location SECTION 6, T1S, R67W

State COLORADO

Country UNITED STATES

API Number 050011046800

Geographic Region DJ BASIN

County ADAMS

Rig Number PRECISION 460

AFF # 19DC0160

Field WATTENBERG

Ground Elevation 5068.4'

K.B. Elevation 5088.4'

Logged Interval 6000' MD To 18102' MD

Total Depth 18102' MD

Formation NIOBRARA A CHALK

Type of Drilling Fluid OIL BASED MUD

Operator

Company Great Western Operating Company, LLC

Address 1001 17th Street, Suite 2000
Denver, CO 80202



Geologist

Name Joey Luce, Zac Olds, Hunter Newman

Company Terra Guidance

Address 67 W. Floyd Ave. Ste 105
Englewood, CO 80110
(970) 260-5408

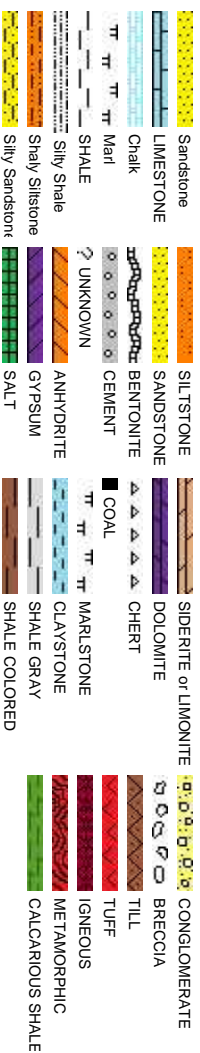


Other

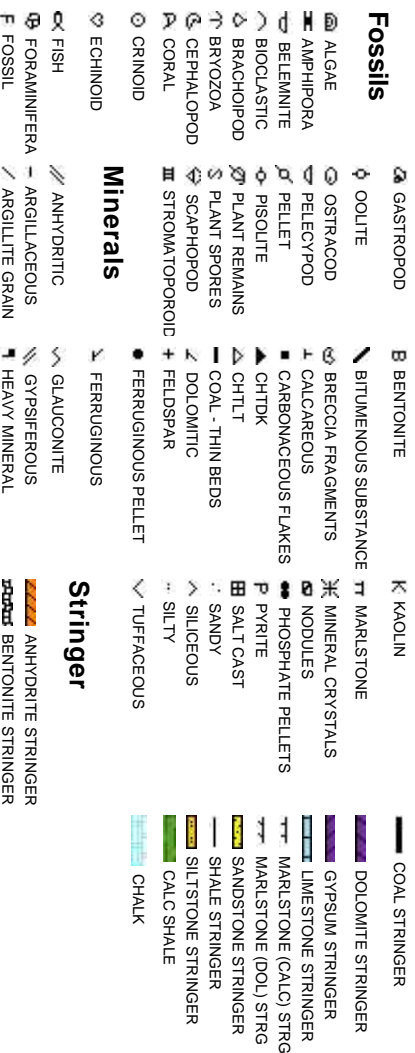
MUDLOG START DATE 08/18/2019

MUDLOG END DATE 08/21/2019

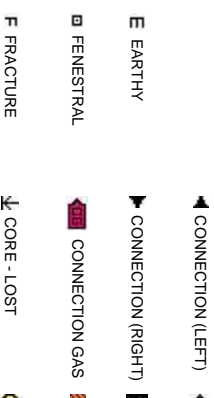
Rock Types



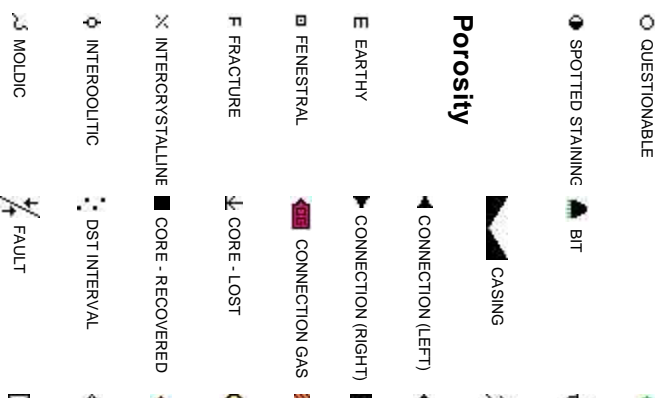
Accessories



Porosity



Engineering



Oil Show






Other Symbols

 FORMATION TOP L LITHOGRAPHIC


Rounding

GAS SHOW  MICROXLN

 MIN DEPTH  ANGULAR  MUDSTONE

NORMAL FAULT  ROUNDED  PACKSTONE

OIL SHOW  SUBANG  WACKESTONE

OVERTURNED STRATA  SUBRND

Sorting

REVERSE FAULT

Textures

SIDEWALL CORE (LEFT)  MODERATE


SIDEWALL CORE (RIGHT)  BOUNDSTONE  POOR

SLIDE  CHALKY  WELL


 SURVEY  CRYPTOXLN

CALCARIUOS SHALE

 TRIP GAS  EARTHY

WIRELINE TESTED - LEFT  FINELYXLN

CALCARIOUS SHALE

WIRELINE TESTED - RT  GRAINSTONE

TERRA GUIDANCE
BEGAN LOGGING @ 15:53 MDT 08/18/2019
BLOODHOUND GAS CHROMATOGRAPH #5927
100' Sample Collection

ROP
ROP
Gamma

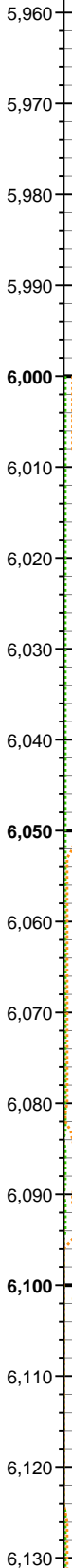
GAPS IN GAMMA DATA DUE
TO HIGH RATES OF PENETRATION

Gas Scale
0 - 3500 Units

BG: BACKGROUND GAS
TG: TRIP GAS
DTG: DOWNTIME GAS
MG: MAX GAS

GAS
C1
C2
C3
C4
CO2

Depth



Images



% Lithology

TVD Scale
5500' - 8500'

MD: 6,004'
INC: 29.47°
AZM: 280.1°
TVD: 5,655.09'
VS: 216.47'

MD: 6,094'
INC: 26.71°
AZM: 278.36°
TVD: 5,734.48'
VS: 220.41'

Well Bore
TVD

TVD (ft)

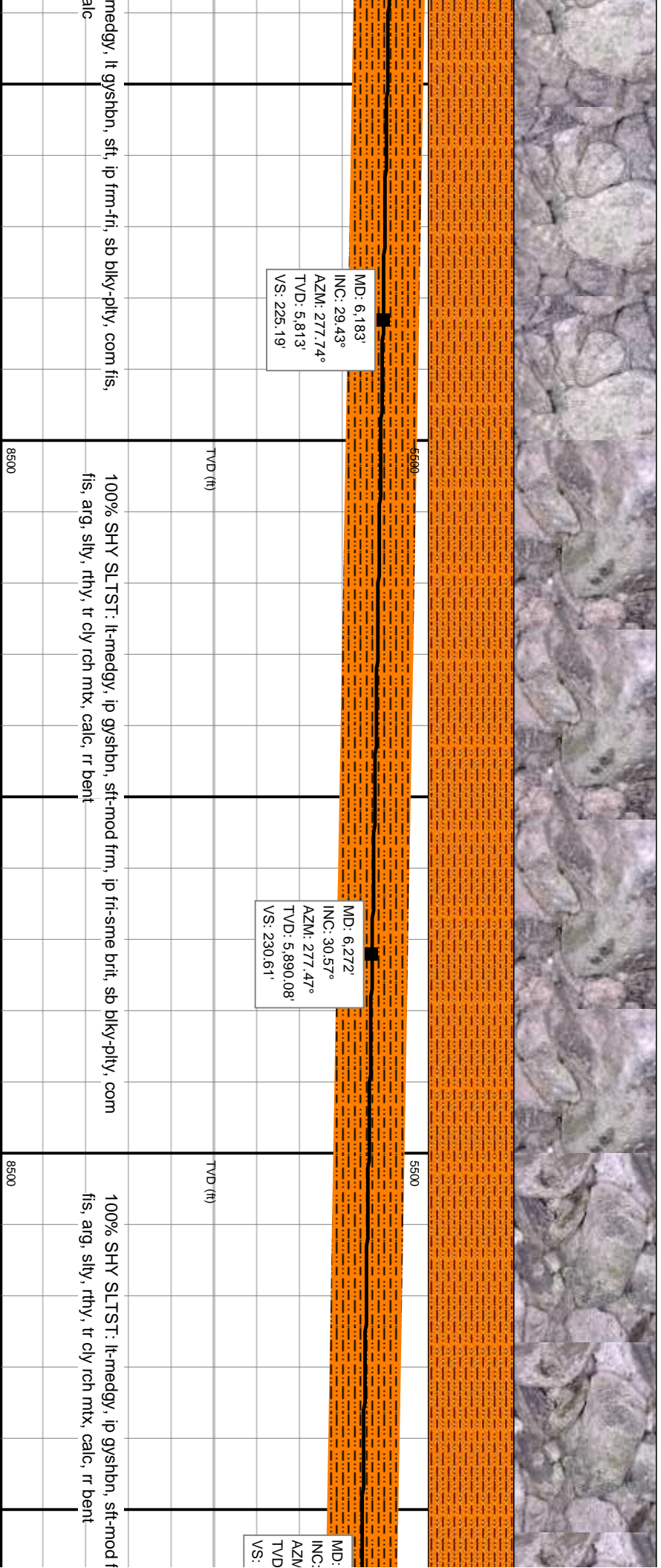
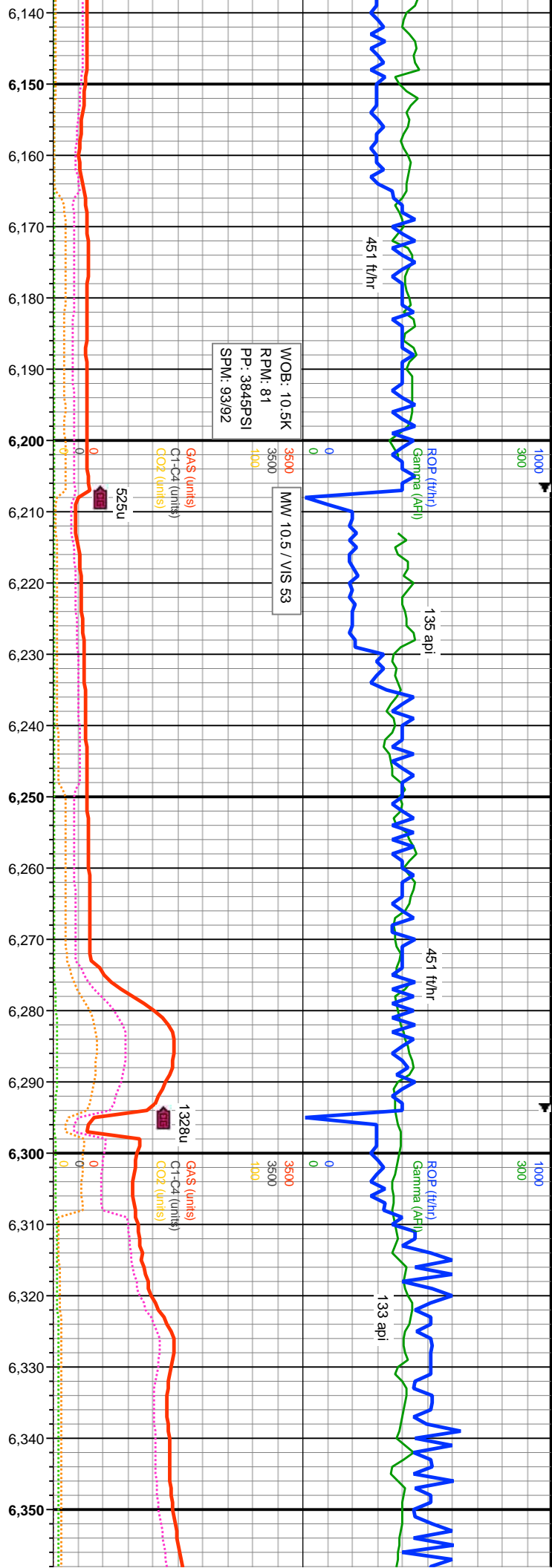
TVD (ft)

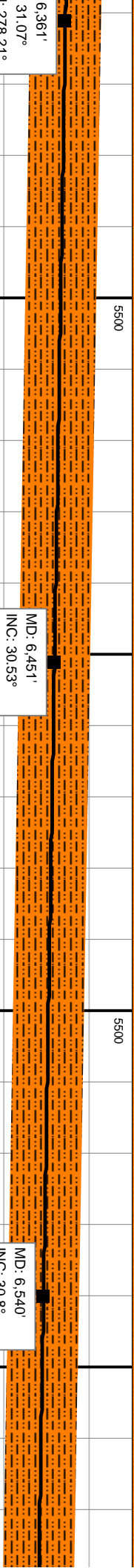
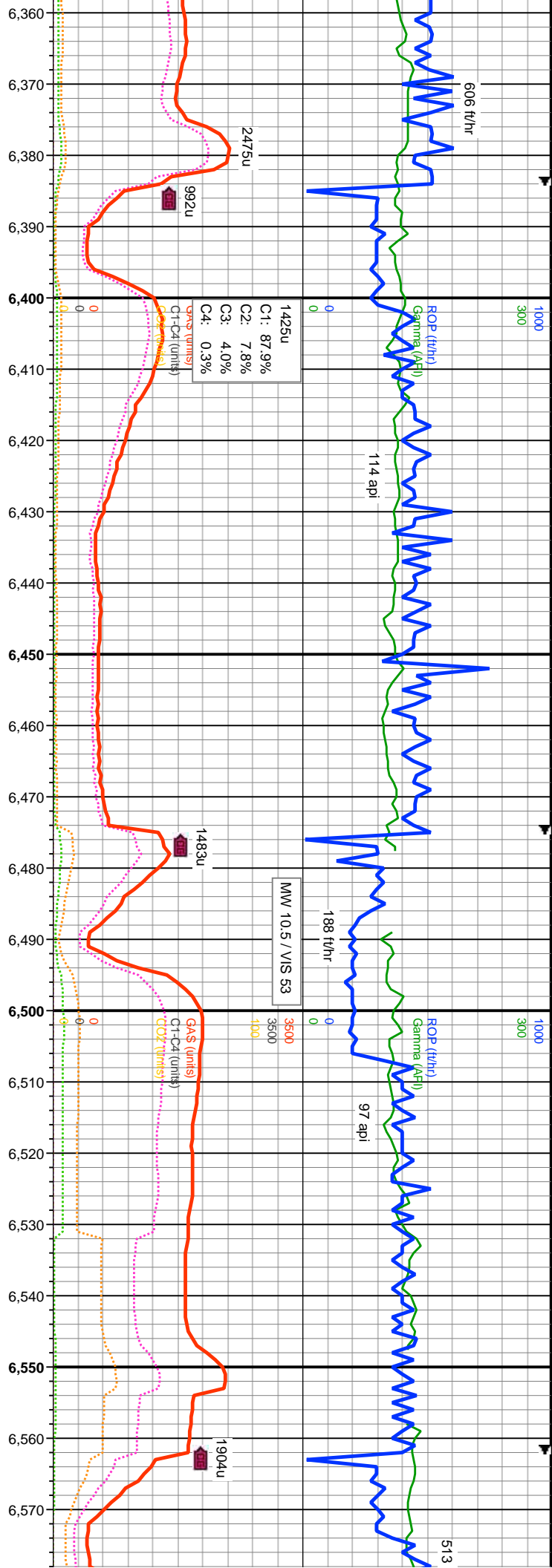
TVD (ft)

Bit #: 1
Size: 8.5"
Make: HCC
Model: ATD505T
Jets: 5x15
S/N: 5299562
Depth In: 1779'

100% SHY SLTST: lgy, sme medgy, lt gysbhn, sft, ip frm-fri, sb blk-y-pkly, com fts,
arg, slty, rthy, tr cly rch mtix, calc

100% SHY SLTST: lgy, sme
arg, slty, rthy, tr cly rch mtix, calc





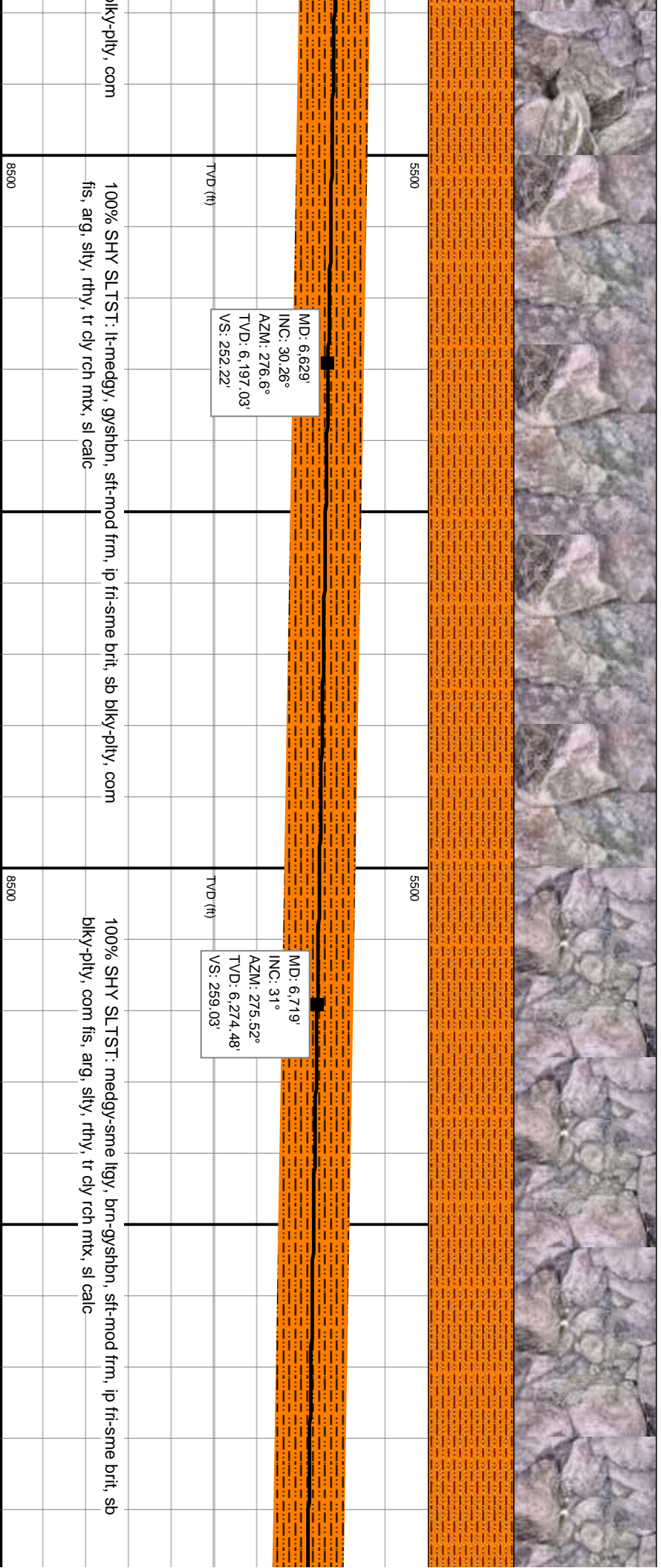
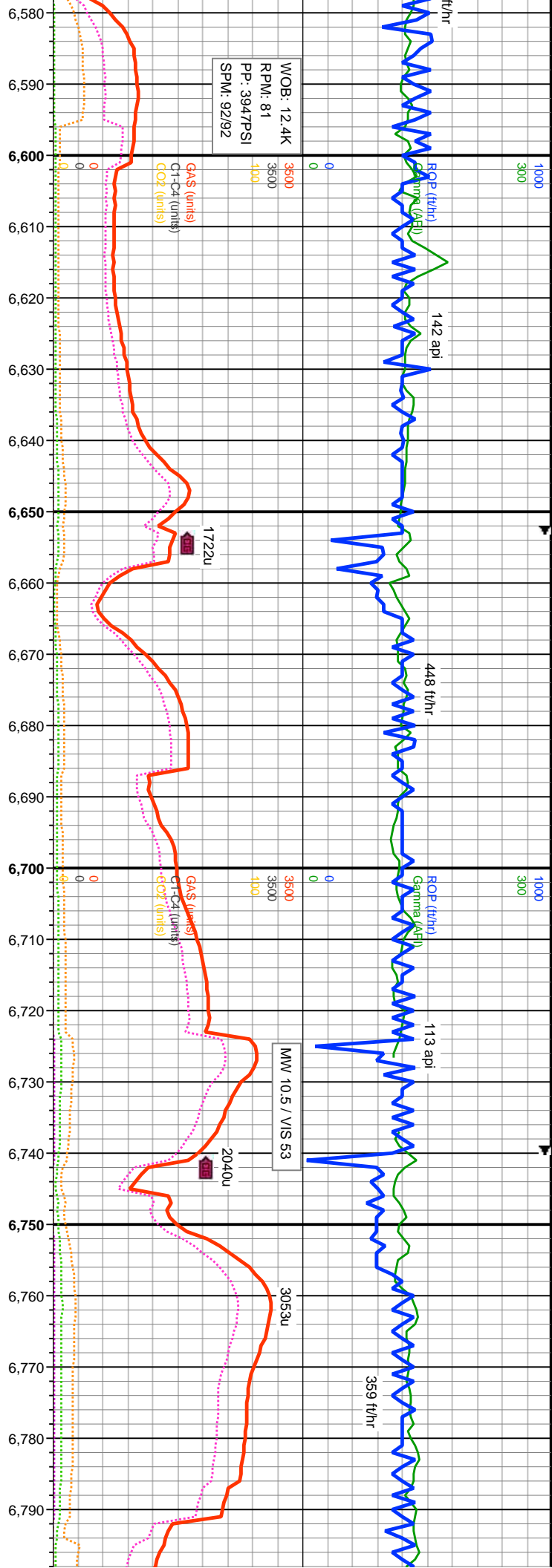
6,361'
31.07°
I: 278.21°
: 5,966.51'
235.98'

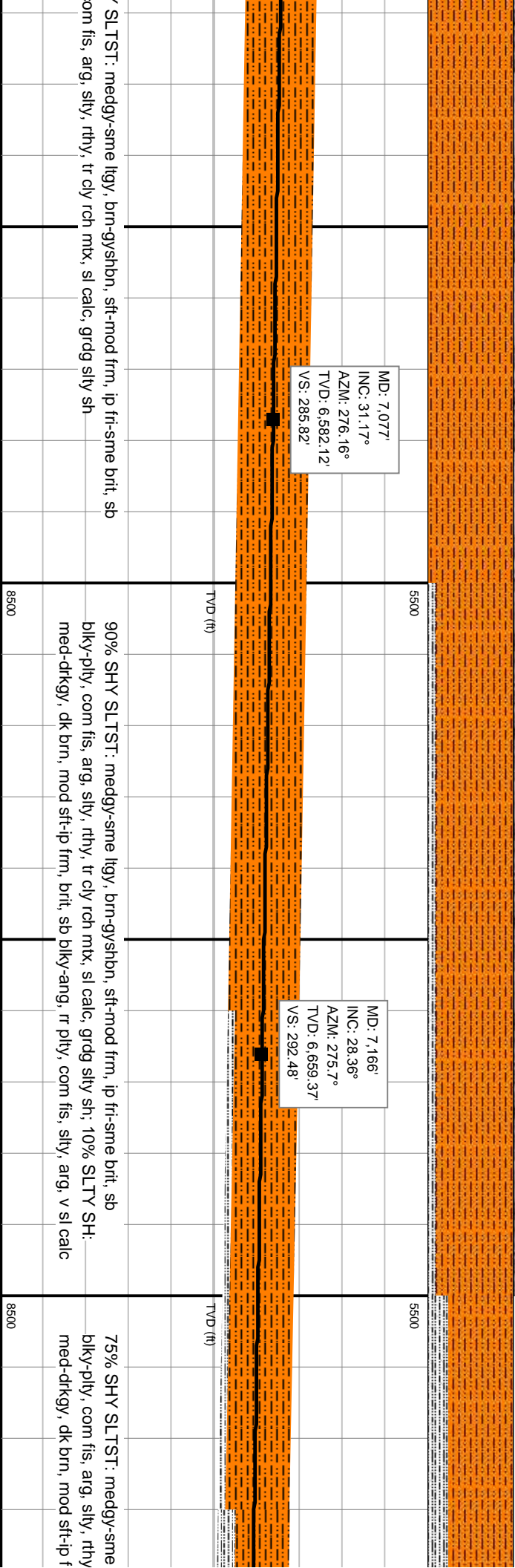
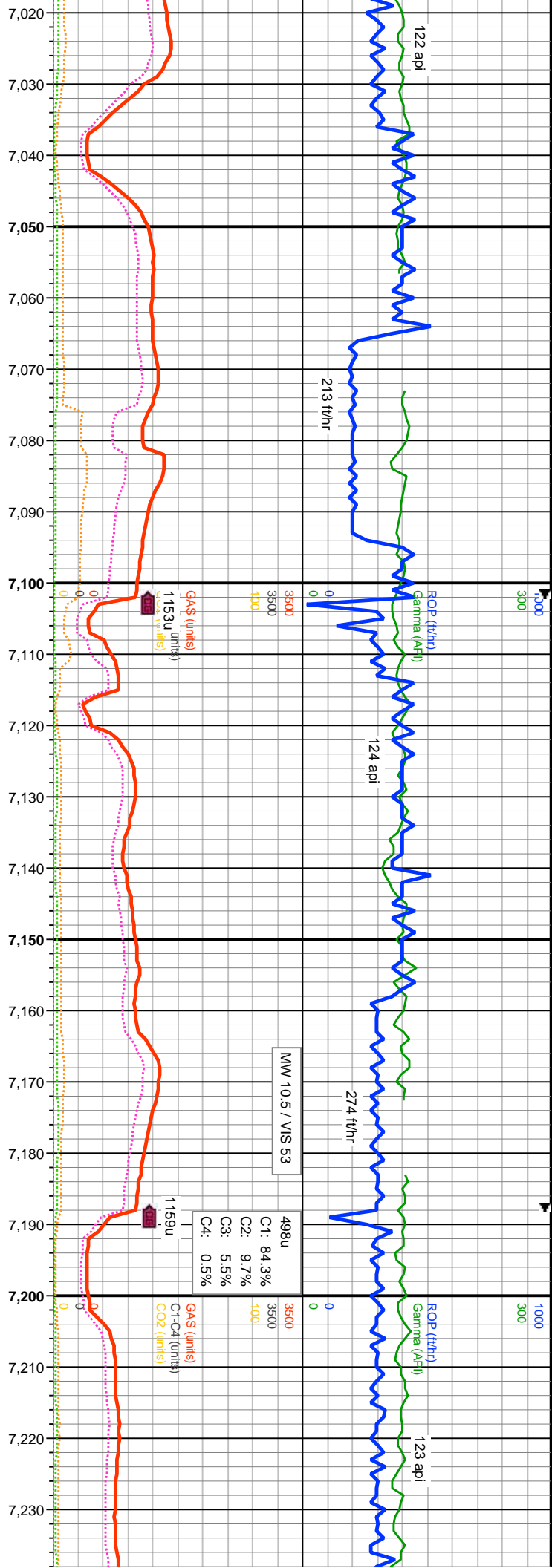
MD: 6,451'
INC: 30.53°
AZM: 279.24°
TVD: 6,043.81'
VS: 240.7'

MD: 6,540'
INC: 30.8°
AZM: 276.67°
TVD: 6,120.37'
VS: 245.95'

100% SHY SLTST: lt-medgy, gysbhn, sft-mod frm, ip fri-sme brit, sb blk-y-pily, com
fis, arg, silty, rthy, tr cly rch mtx, calc

100% SHY SLTST: lt-medgy, gysbhn, sft-mod frm, ip fri-sme brit, sb blk-y-pily, com
fis, arg, silty, rthy, tr cly rch mtx, calc

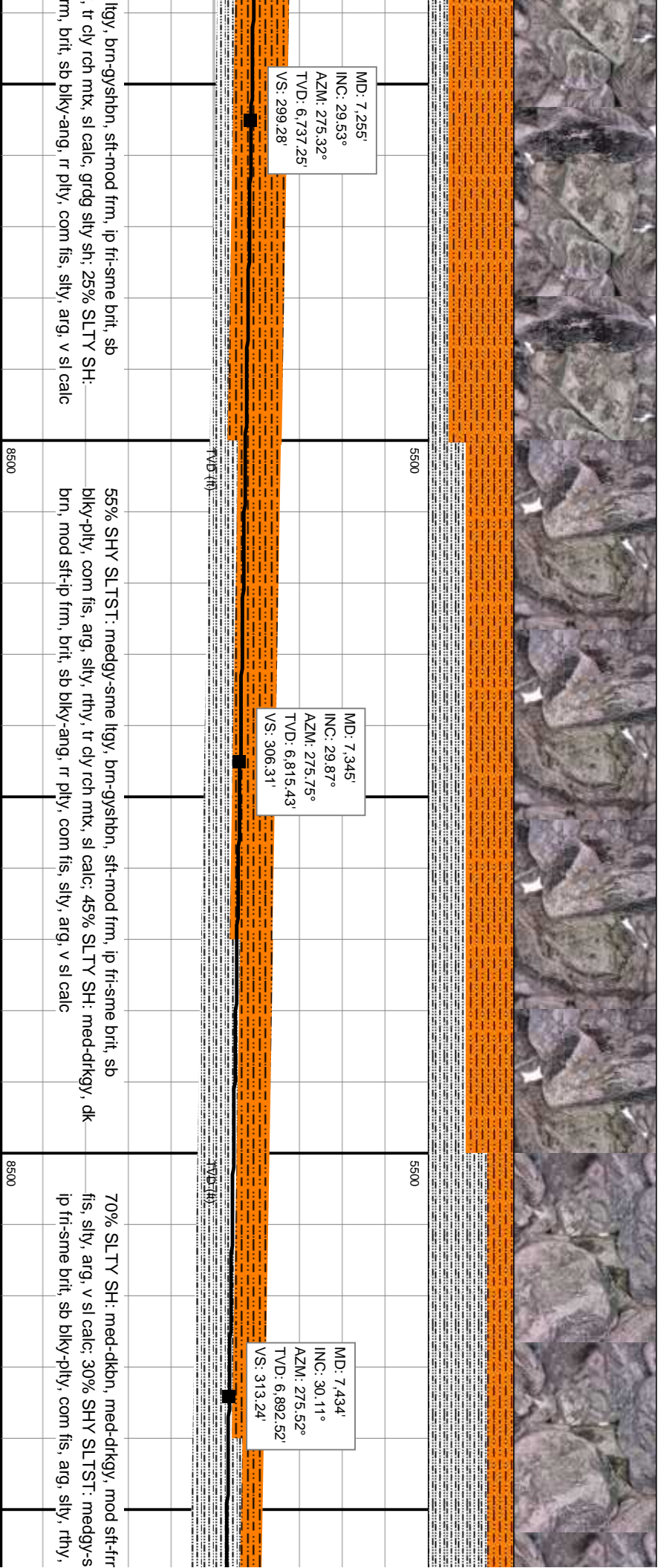
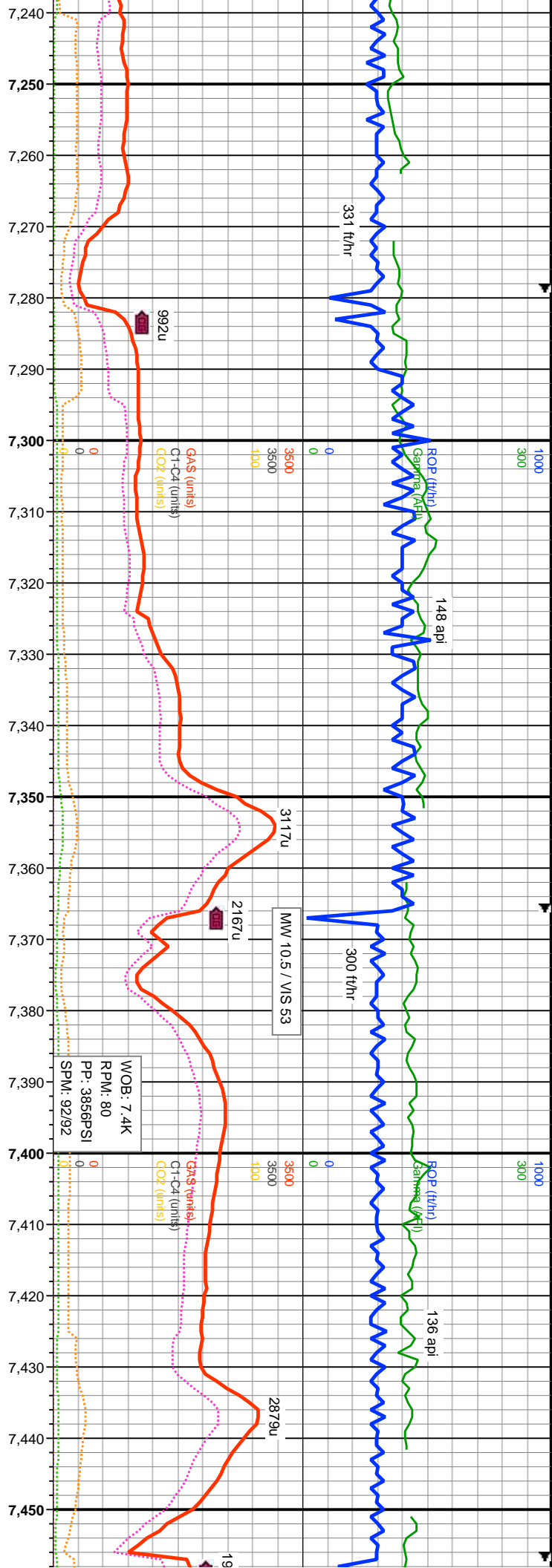




SLTST: medgy-sme llyg, brn-gyshbn, sft-mod frm, ip fri-sme brit, sb
om fis, arg, sily, rthy, tr cly roh mxx, sl calc, grdg sily sh

90% SHY SLTST: medgy-sme llyg, brn-gyshbn, sft-mod frm, ip fri-sme brit, sb
biky-pty, com fis, arg, sily, rthy, tr cly roh mxx, sl calc, grdg sily sh, 10% SLTY SH:
med-drtkg, dk brn, mod sft-ip frm, brit, sb biky-ang, rr ply, com fis, sily, arg, v sl calc

75% SHY SLTST: medgy-sme
biky-pty, com fis, arg, sily, rthy
med-drtkg, dk brn, mod sft-ip f



MD: 7.255'
INC: 29.53°
AZM: 275.32°
TVD: 6.737.25'
VS: 299.28'

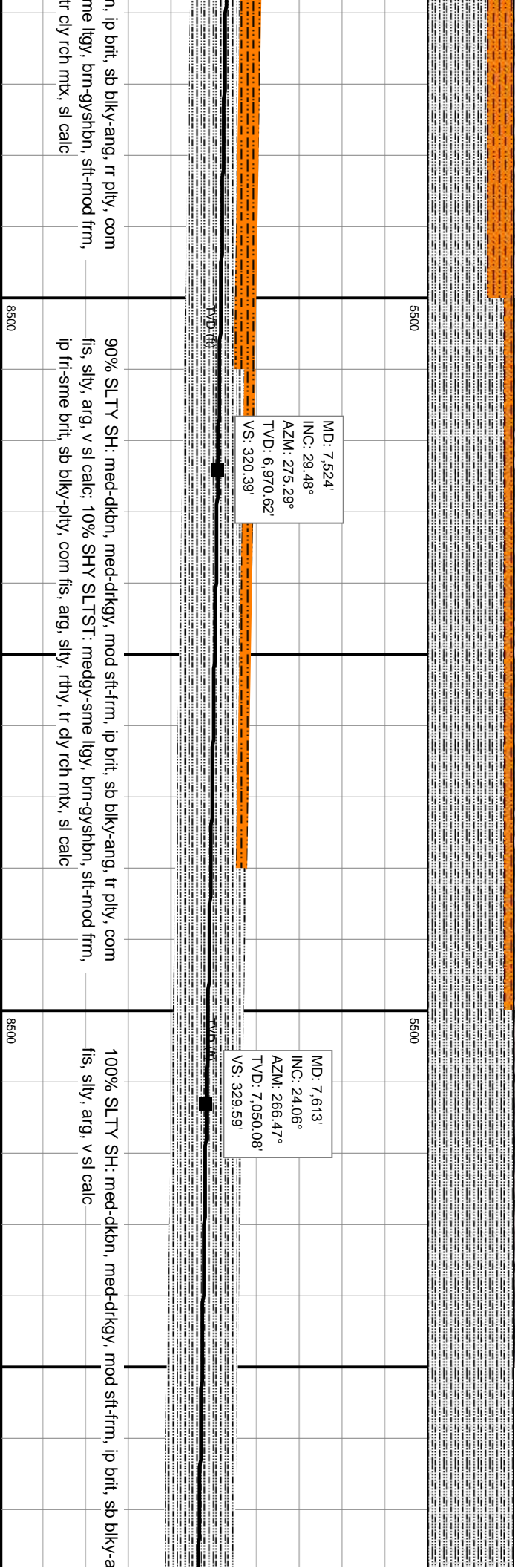
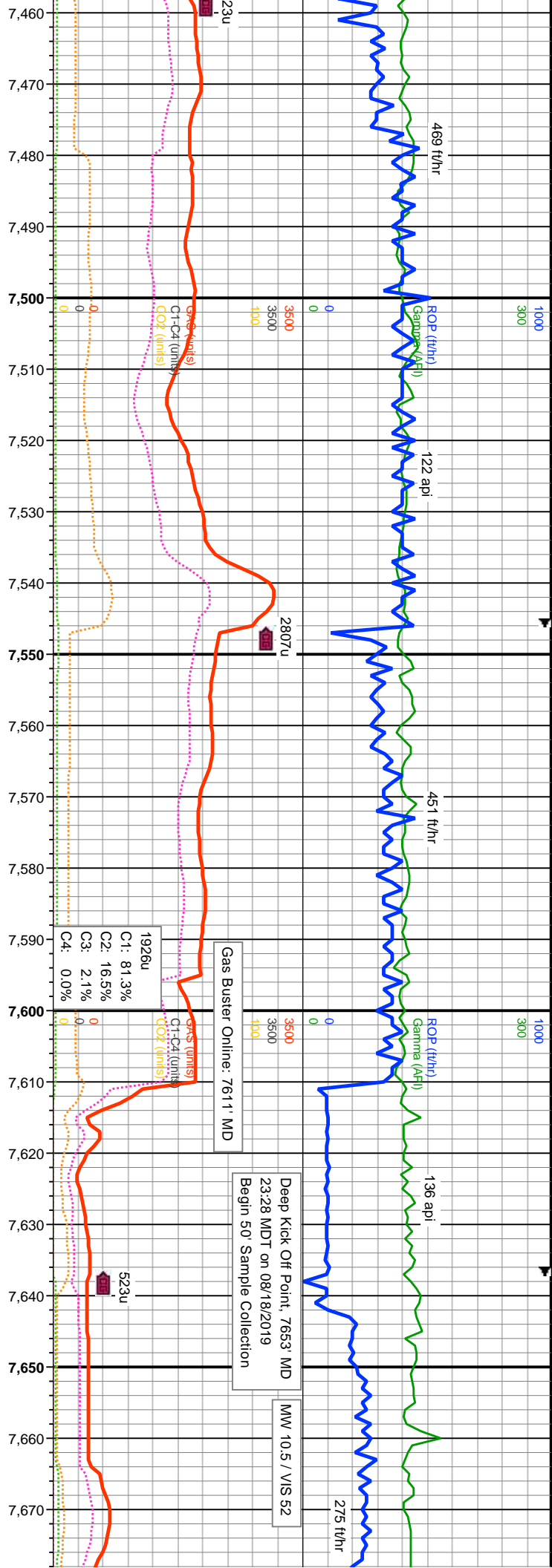
MD: 7.345'
INC: 29.87°
AZM: 275.75°
TVD: 6.815.43'
VS: 306.31'

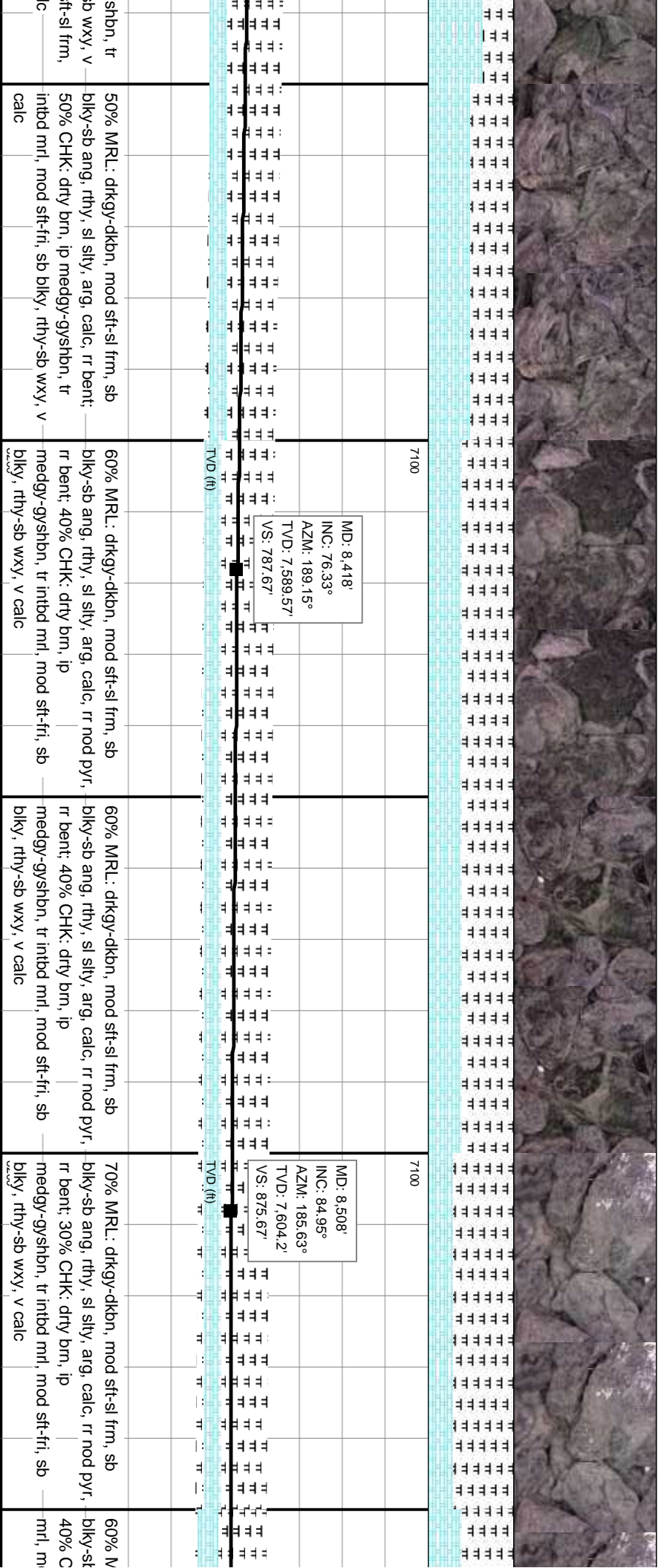
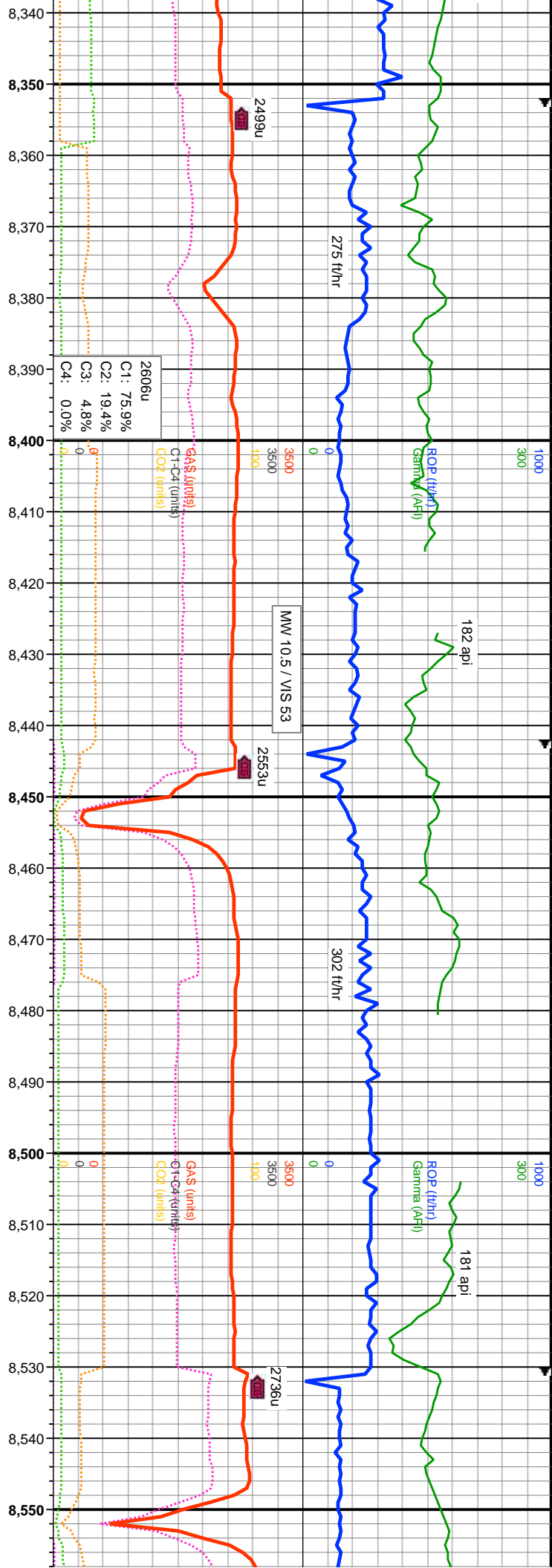
MD: 7.434'
INC: 30.11°
AZM: 275.52°
TVD: 6.892.52'
VS: 313.24'

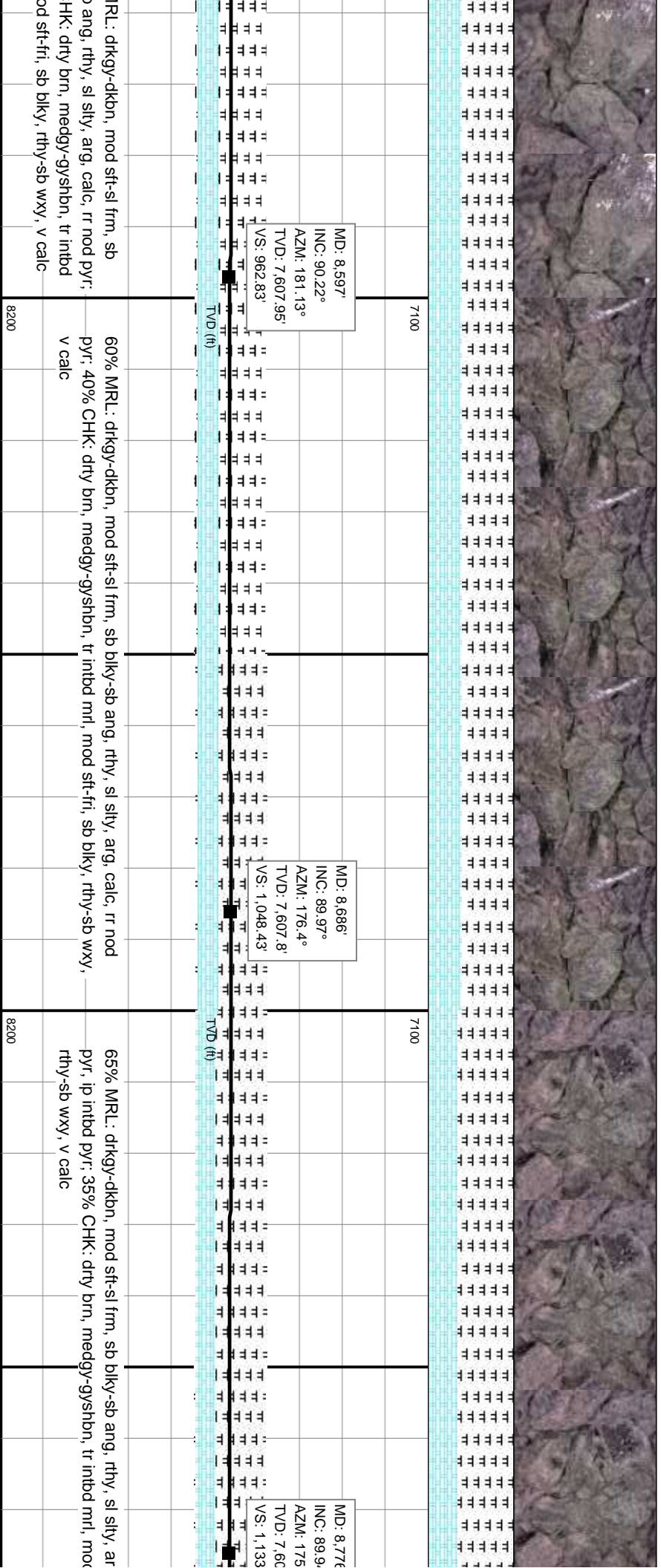
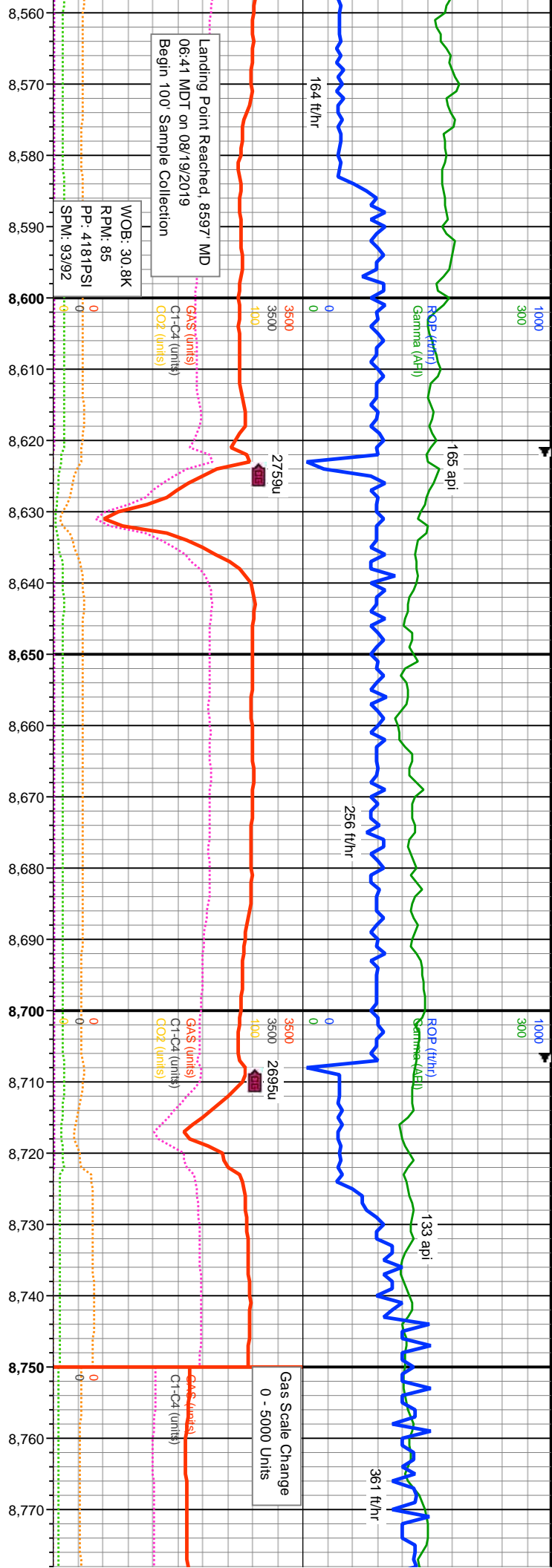
ltyg, brn-gyshbn, sft-mod frm, ip fri-sme brit, sb
tr cly rich mtz, sl calc, grdg silty sh, 25% SLTY SH:
brn, brit, sb blk-ang, rr ply, com fis, silty, arg, v sl calc

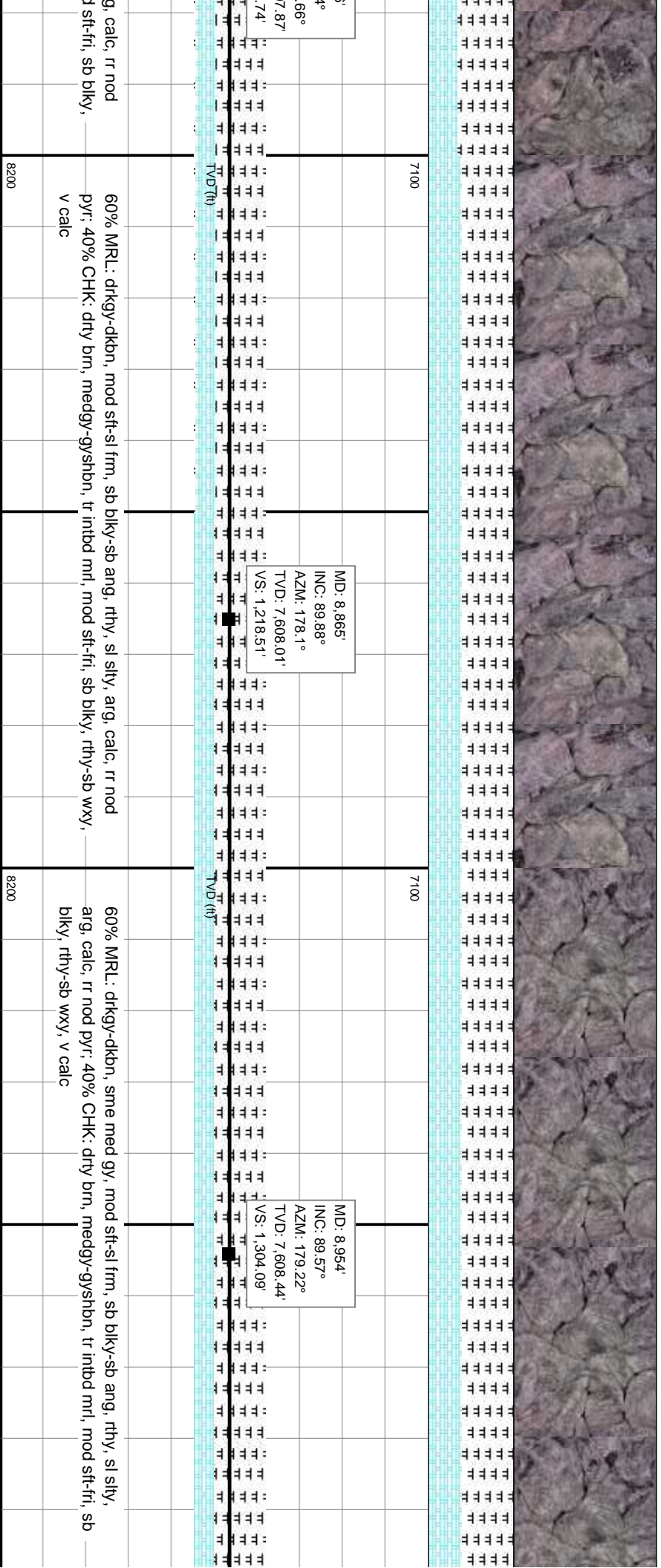
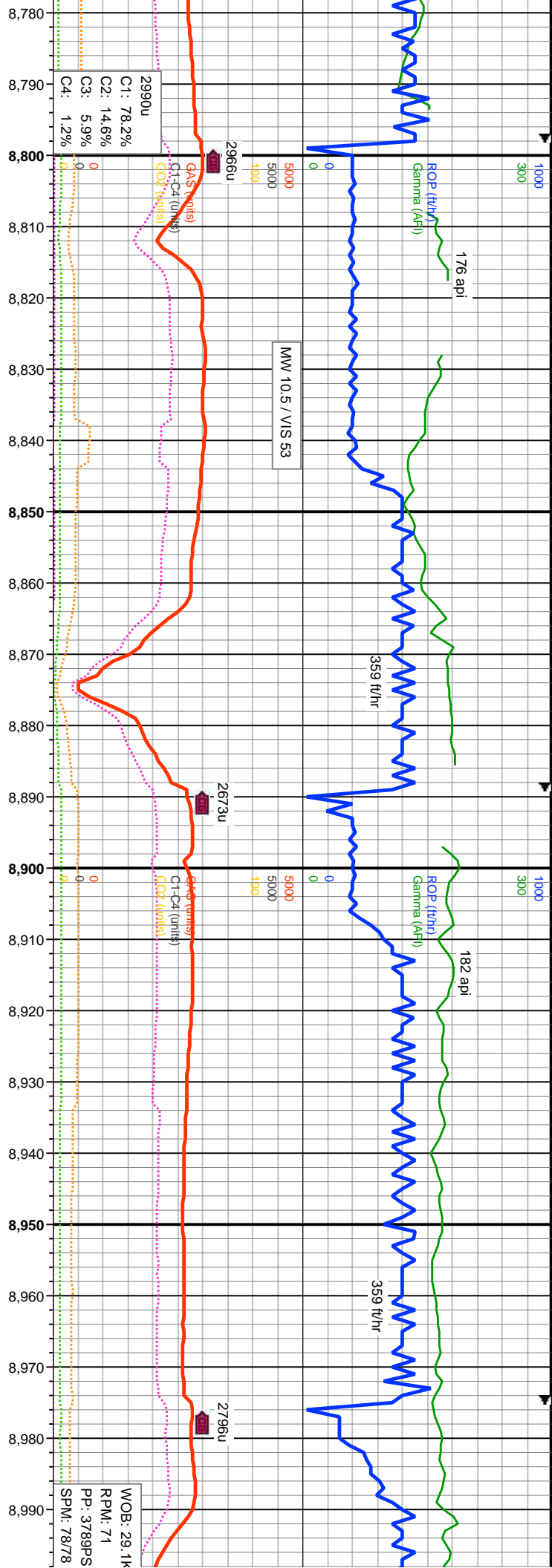
55% SHY SLTST: medgy-sme ltyg, brn-gyshbn, sft-mod frm, ip fri-sme brit, sb
blk-ply, com fis, arg, silty, rthy, tr cly rich mtz, sl calc; 45% SLTY SH: med-dkgy, dk
brn, mod sft-ip frm, brit, sb blk-ang, rr ply, com fis, silty, arg, v sl calc

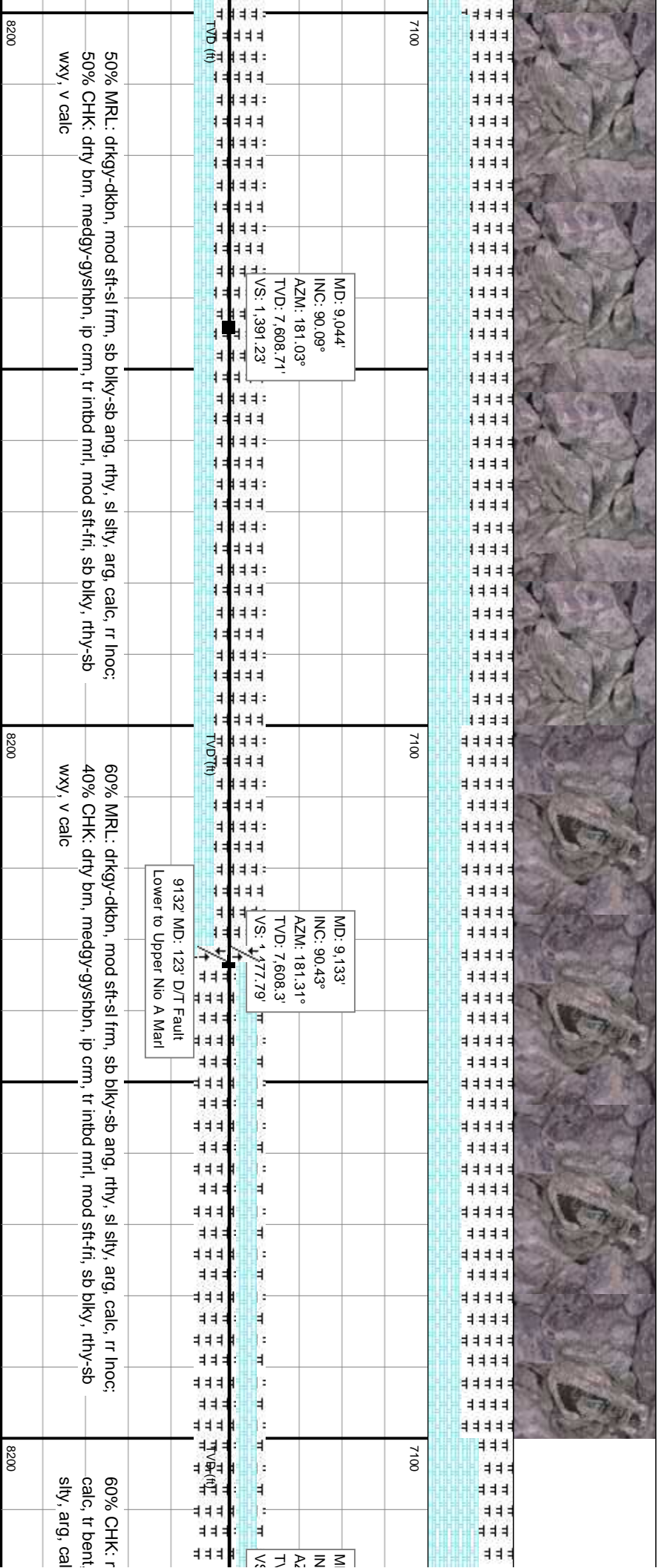
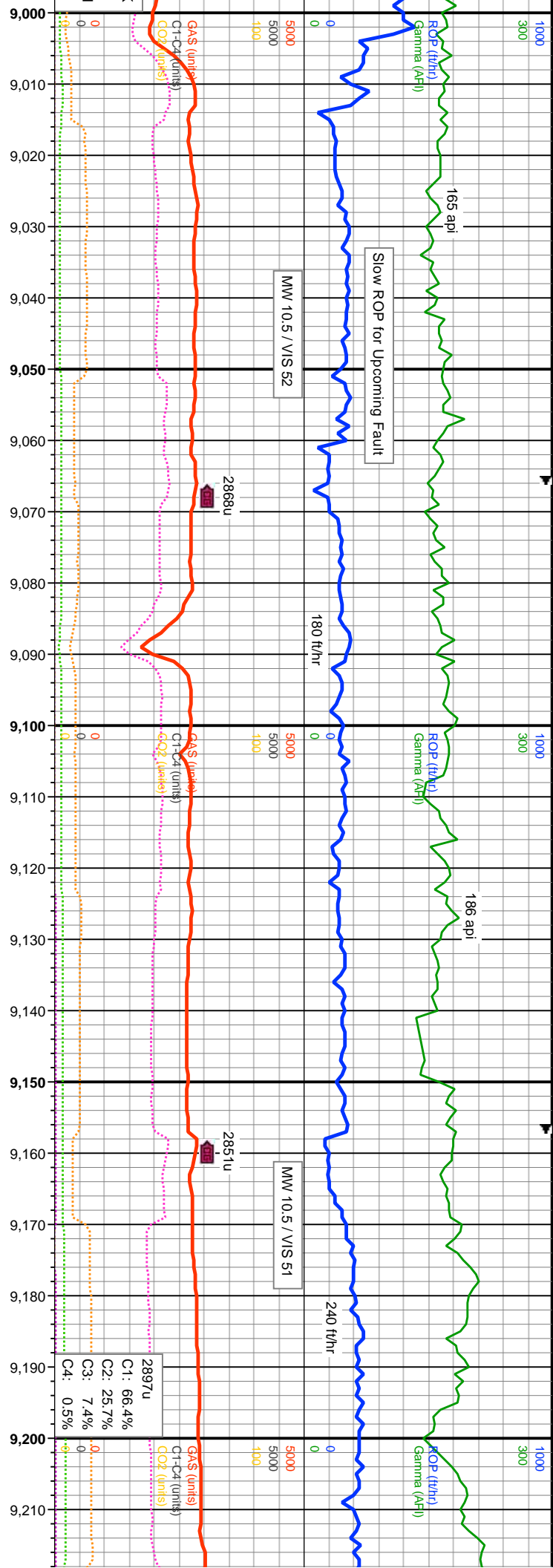
70% SLTY SH: med-dkbn, med-dkgy, mod sft-frm
fis, silty, arg, v sl calc; 30% SHY SLTST: medgy-s
ip fri-sme brit, sb blk-ply, com fis, arg, silty, rthy,

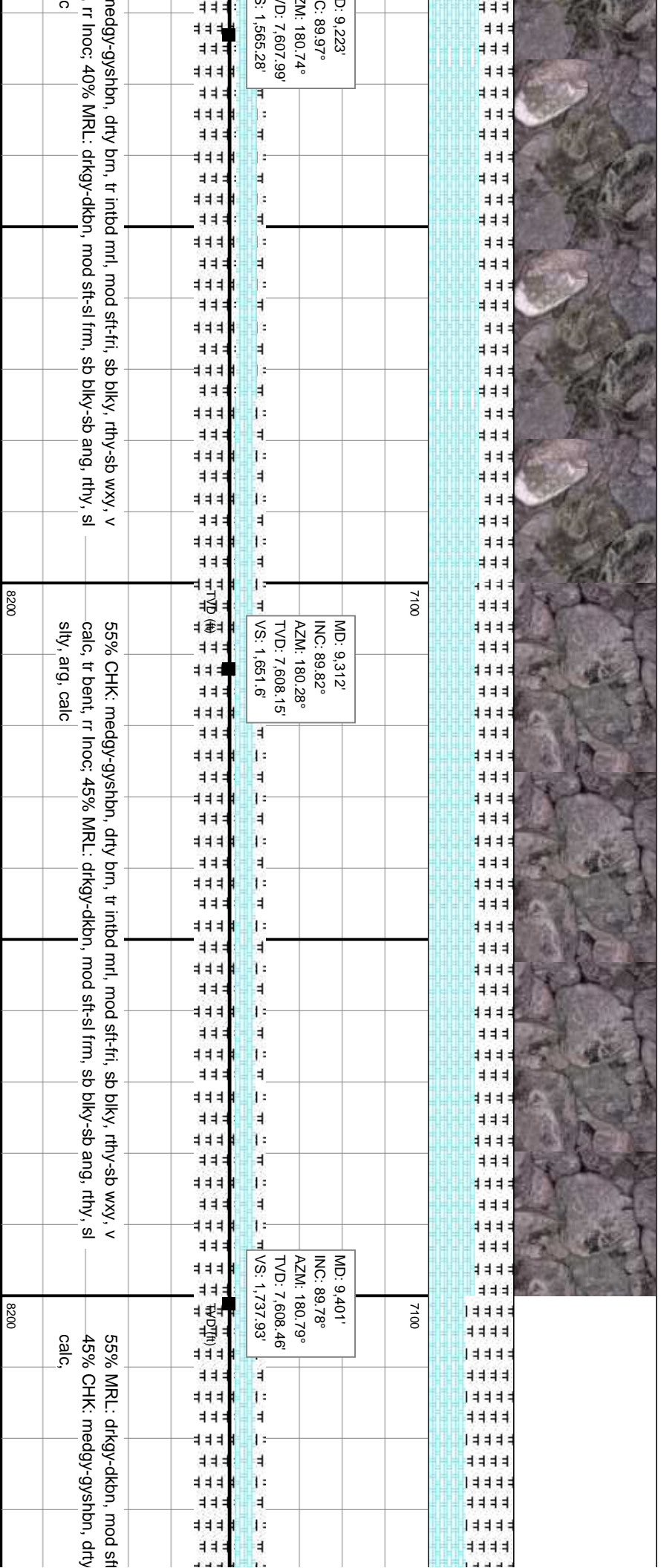
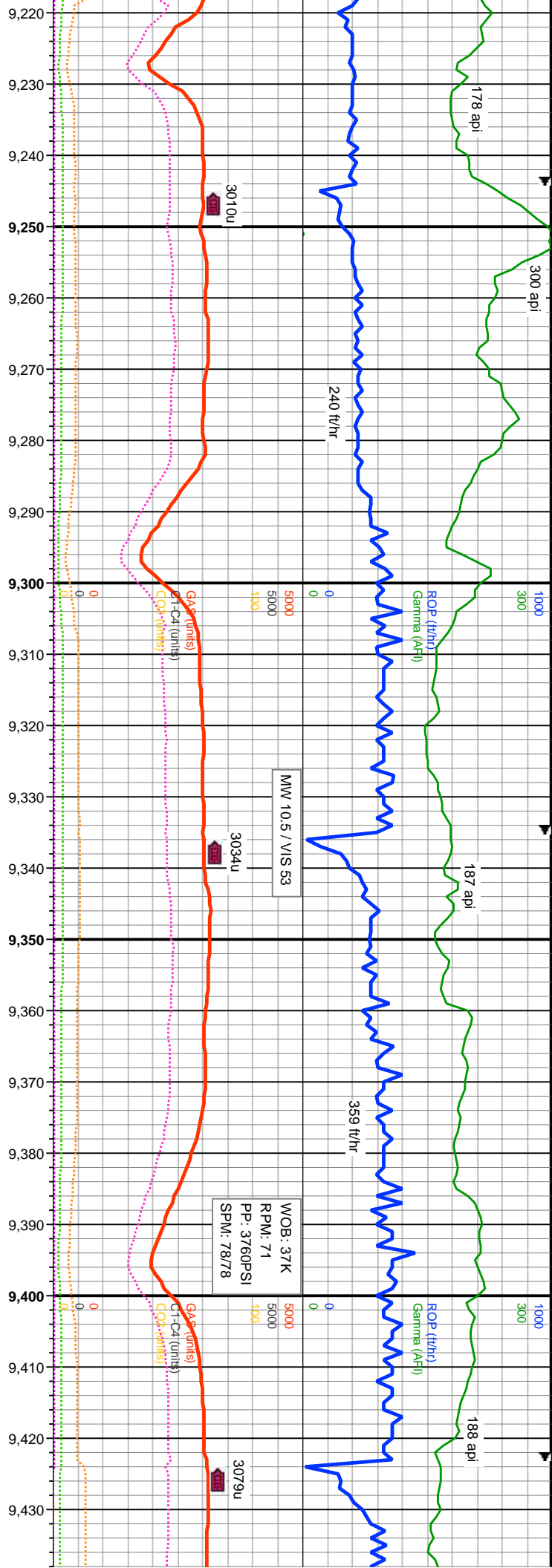


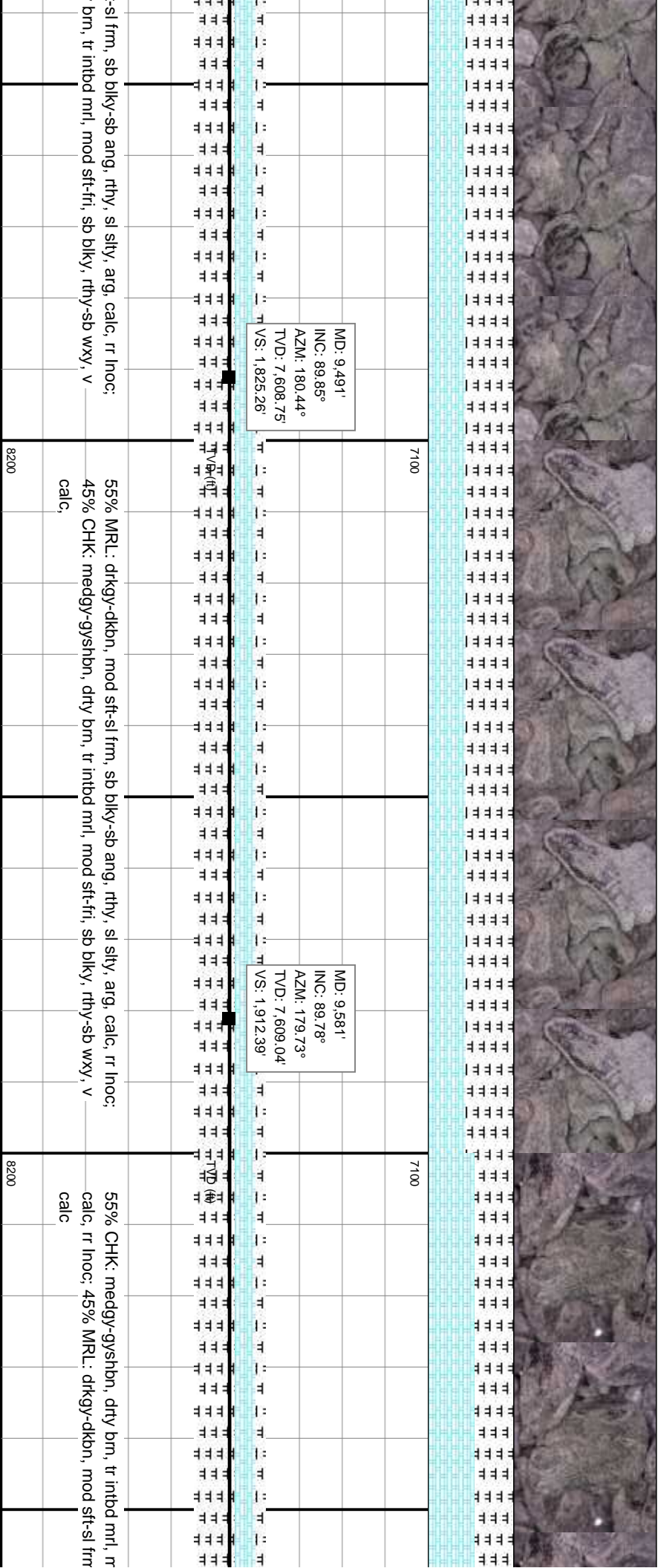
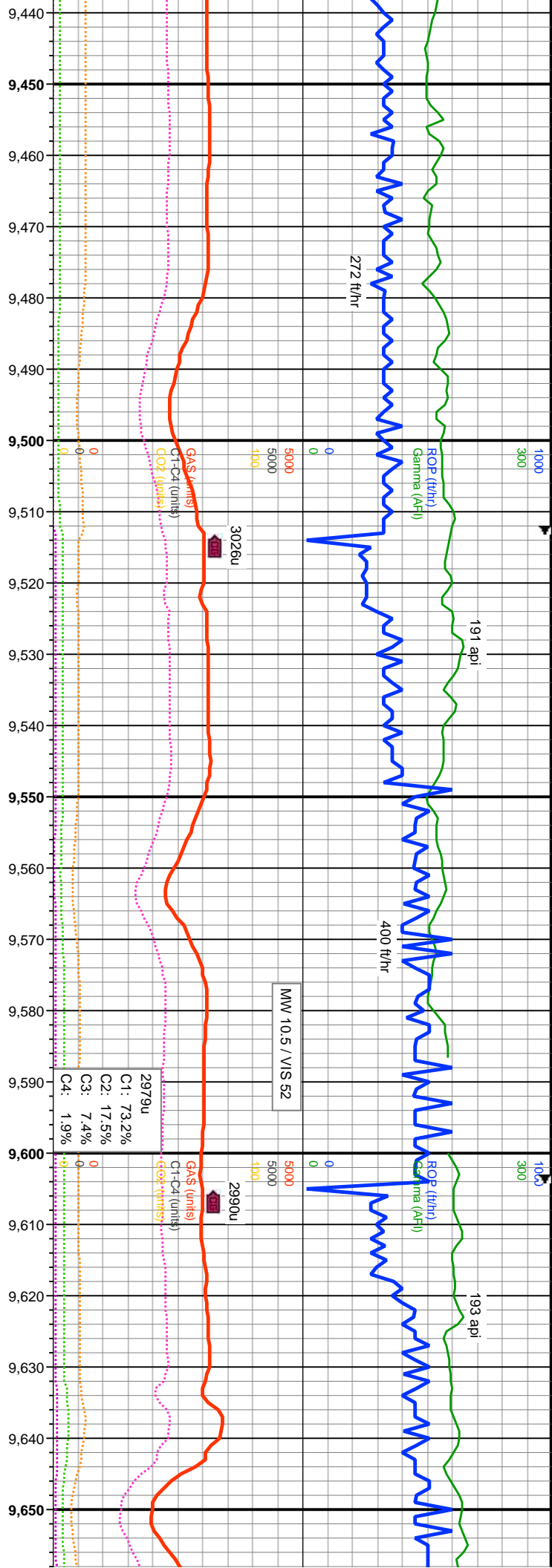


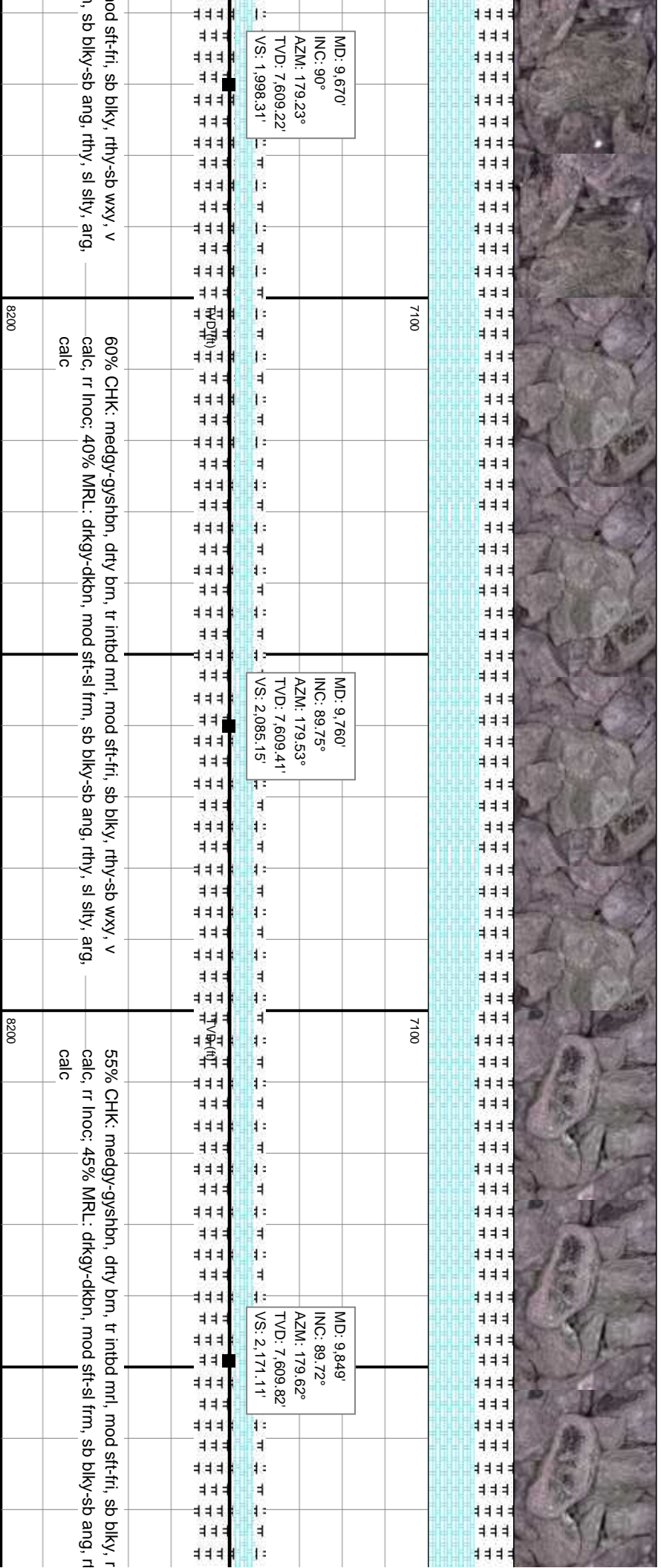
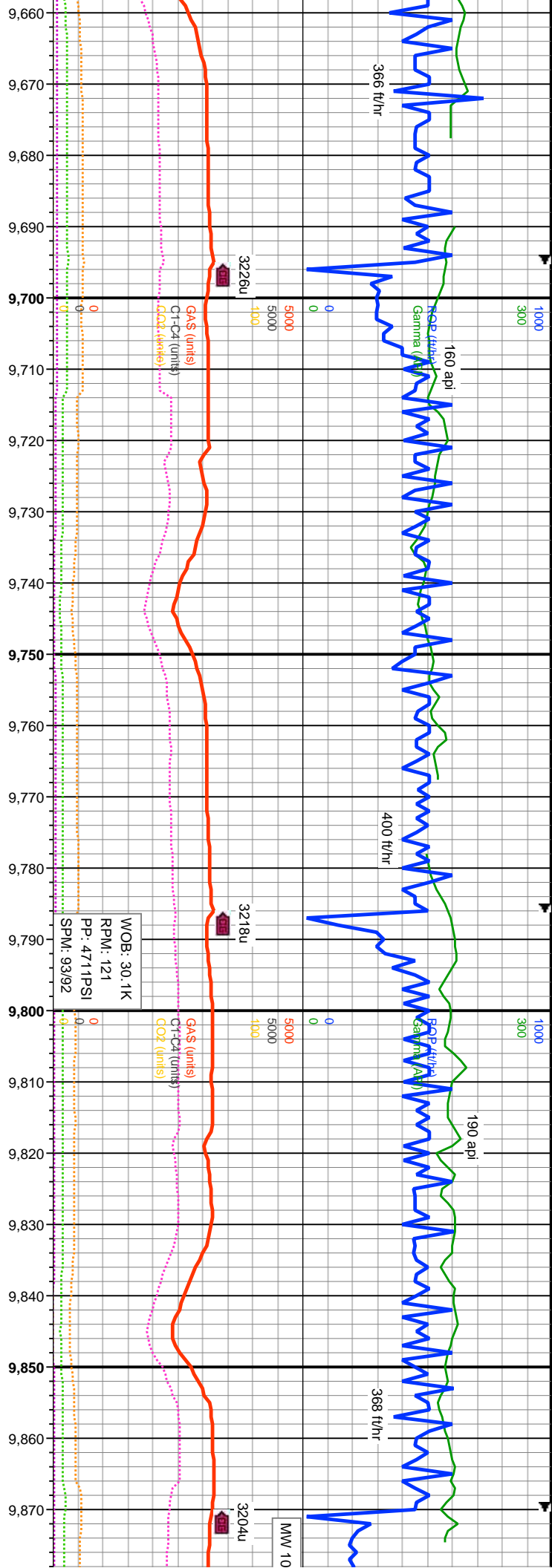


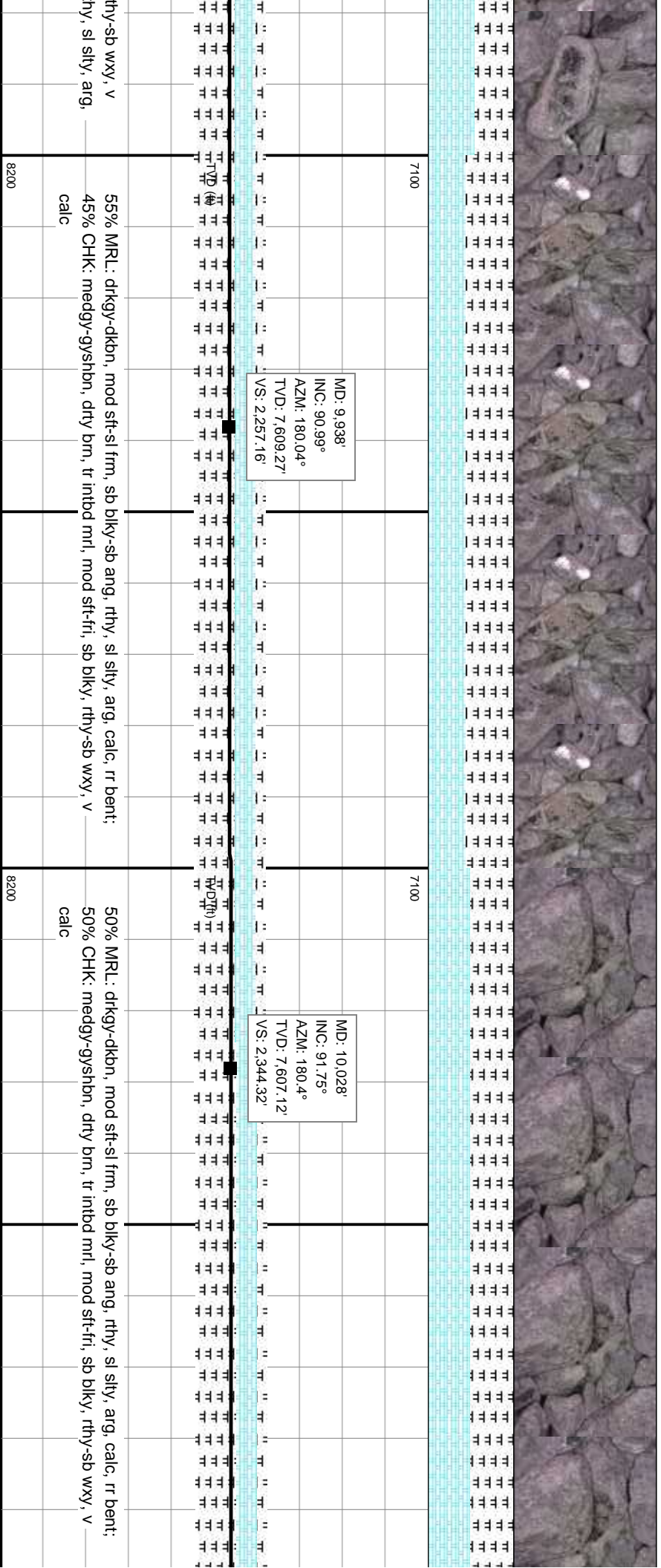
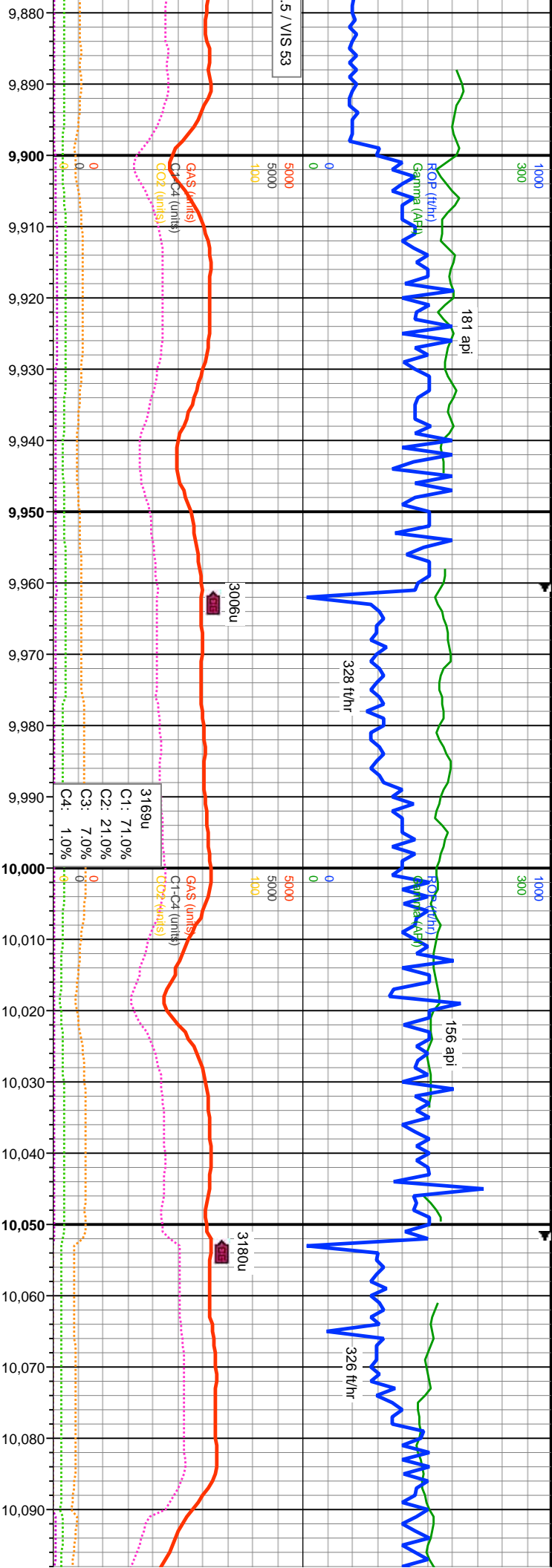


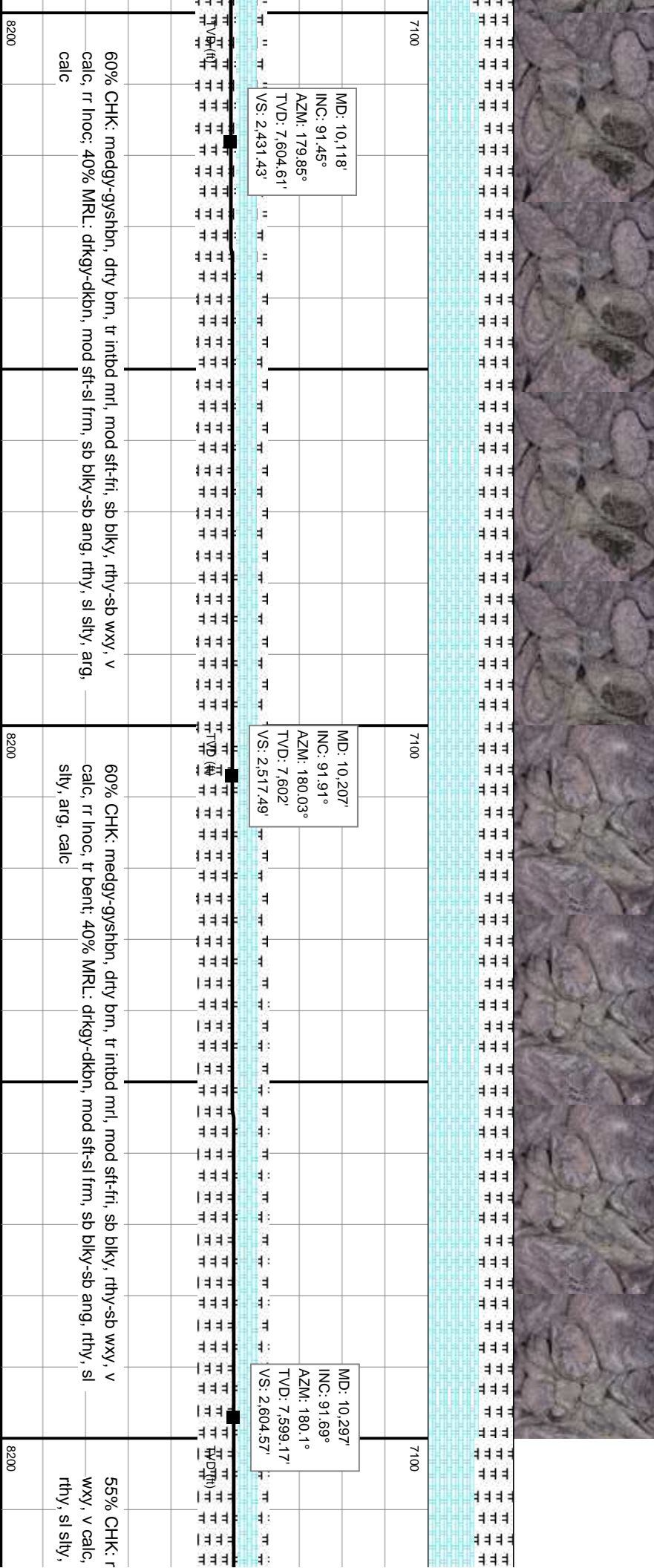
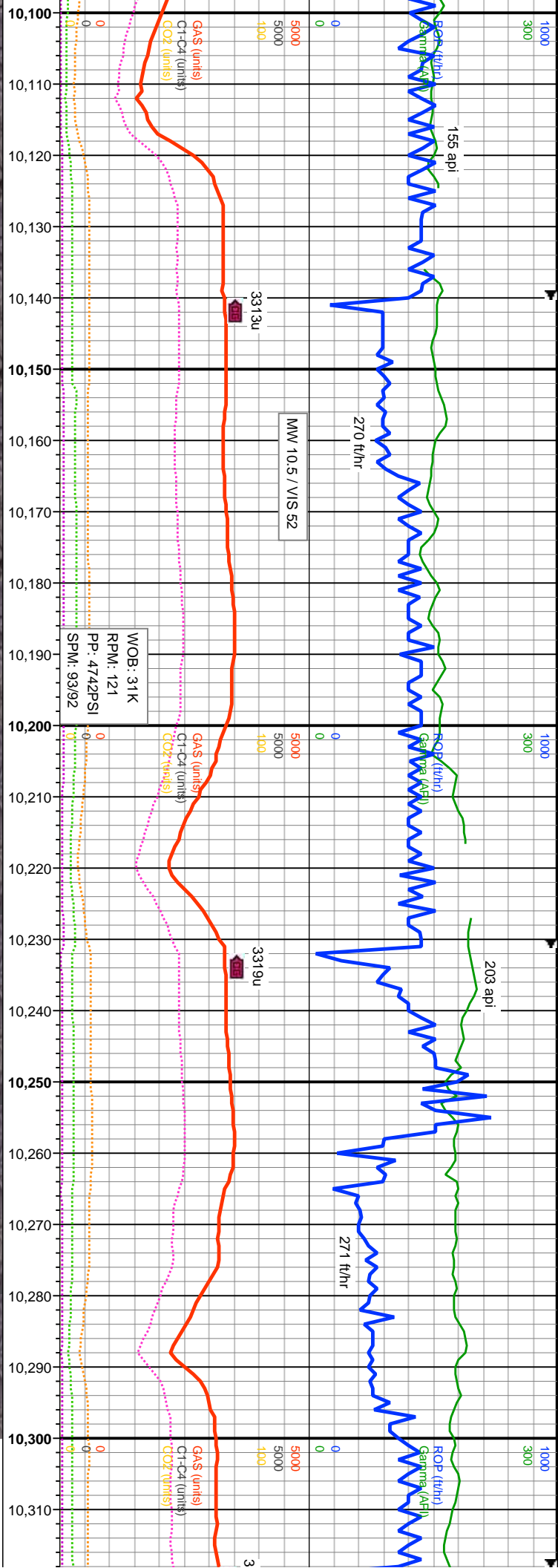


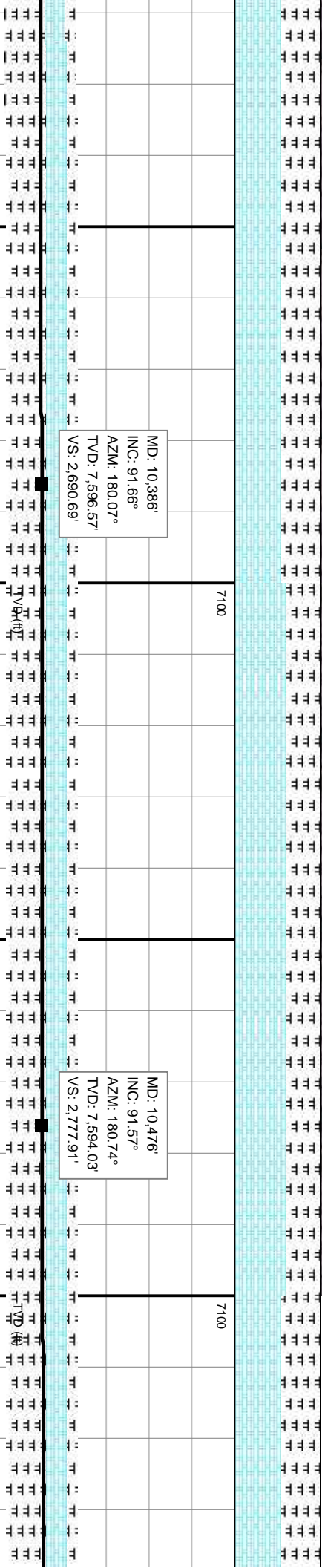
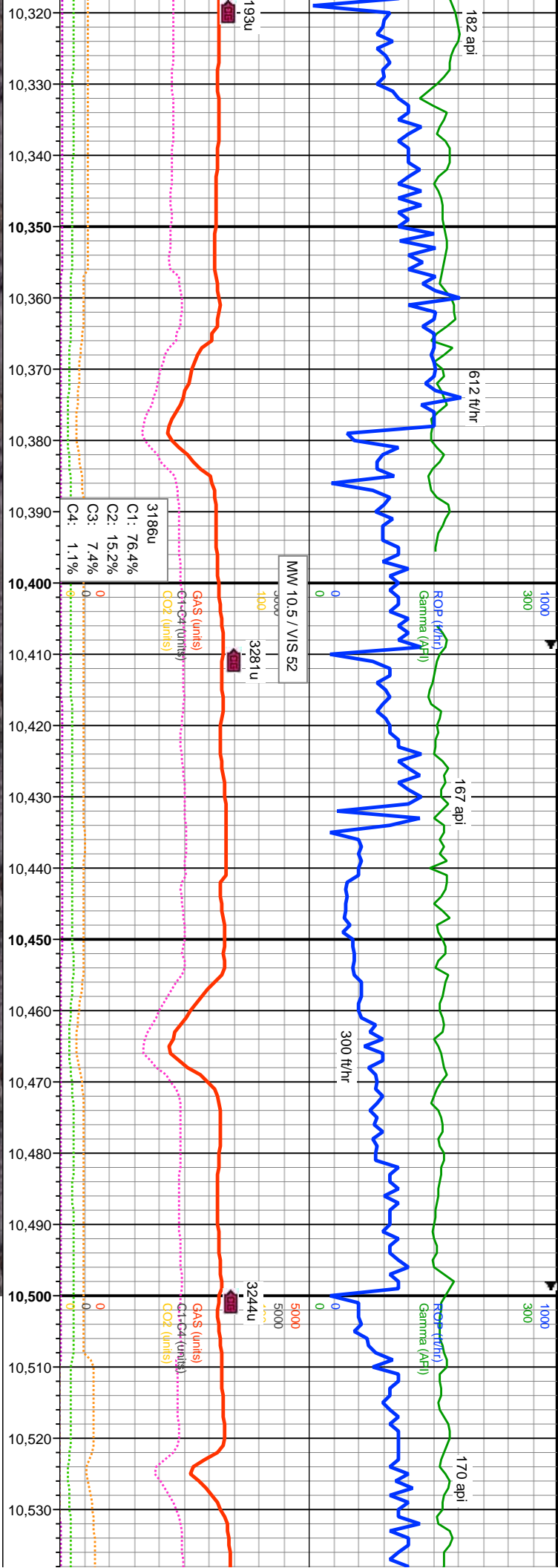








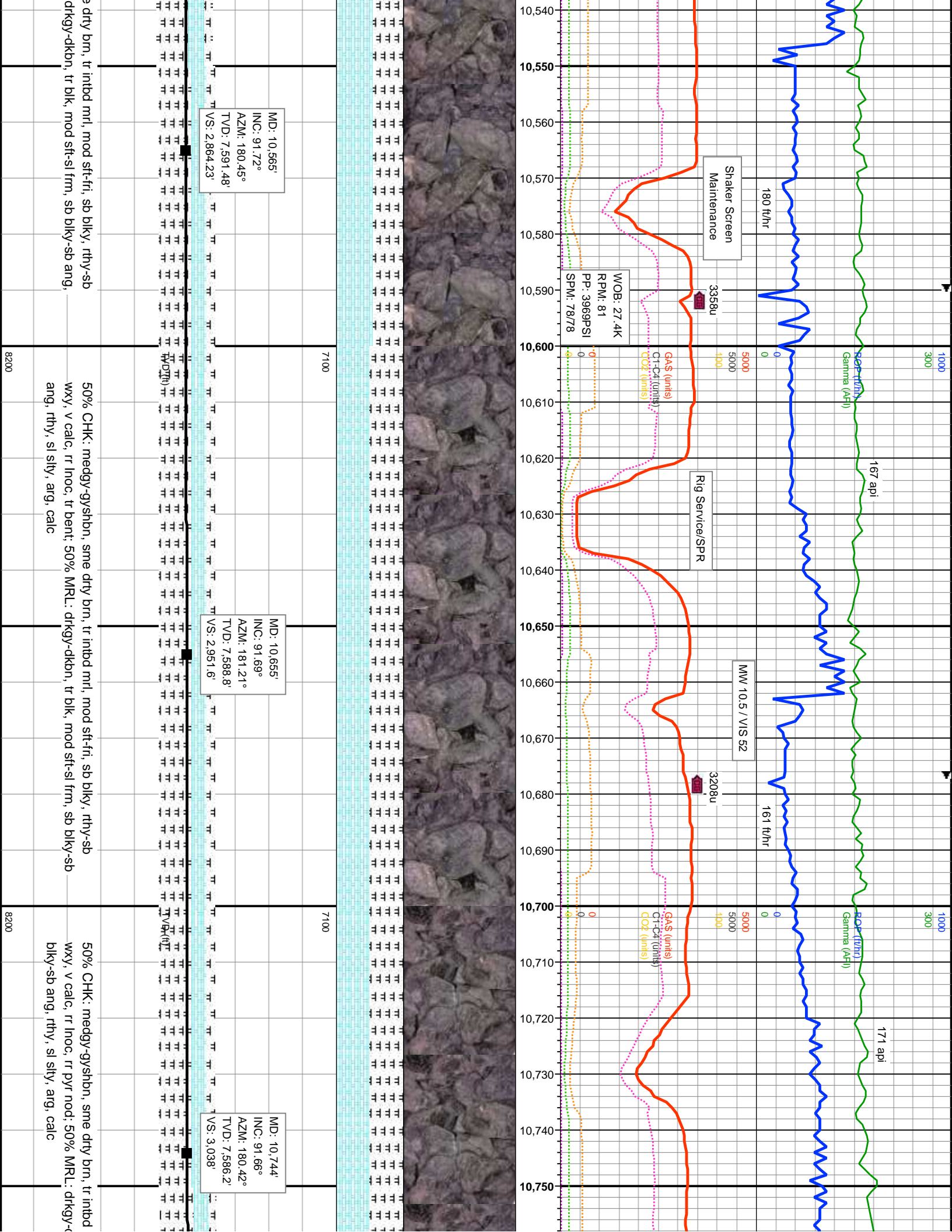


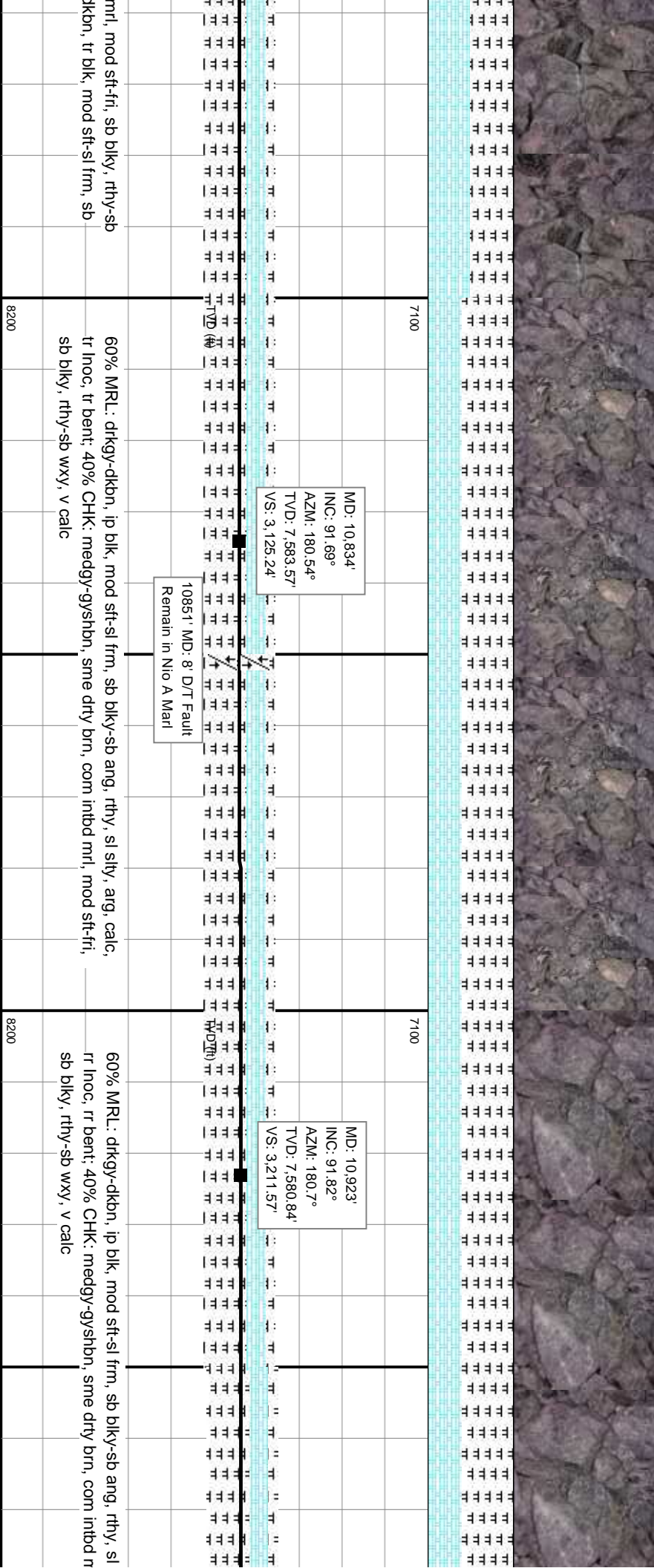
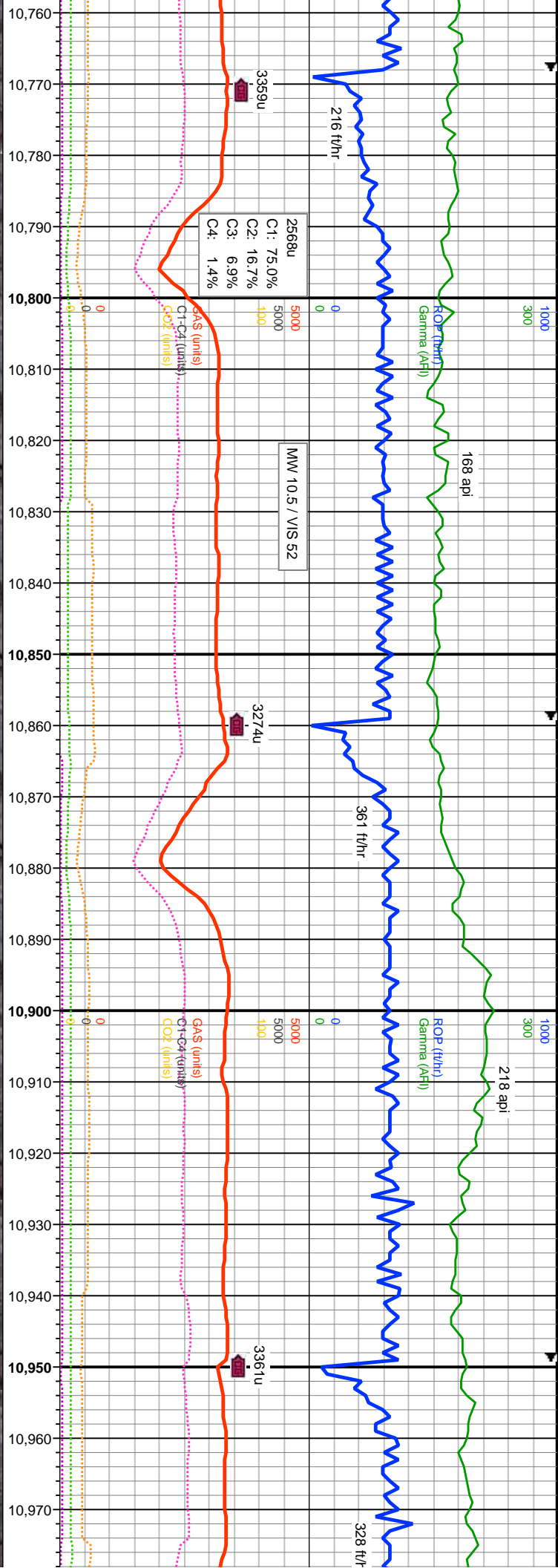


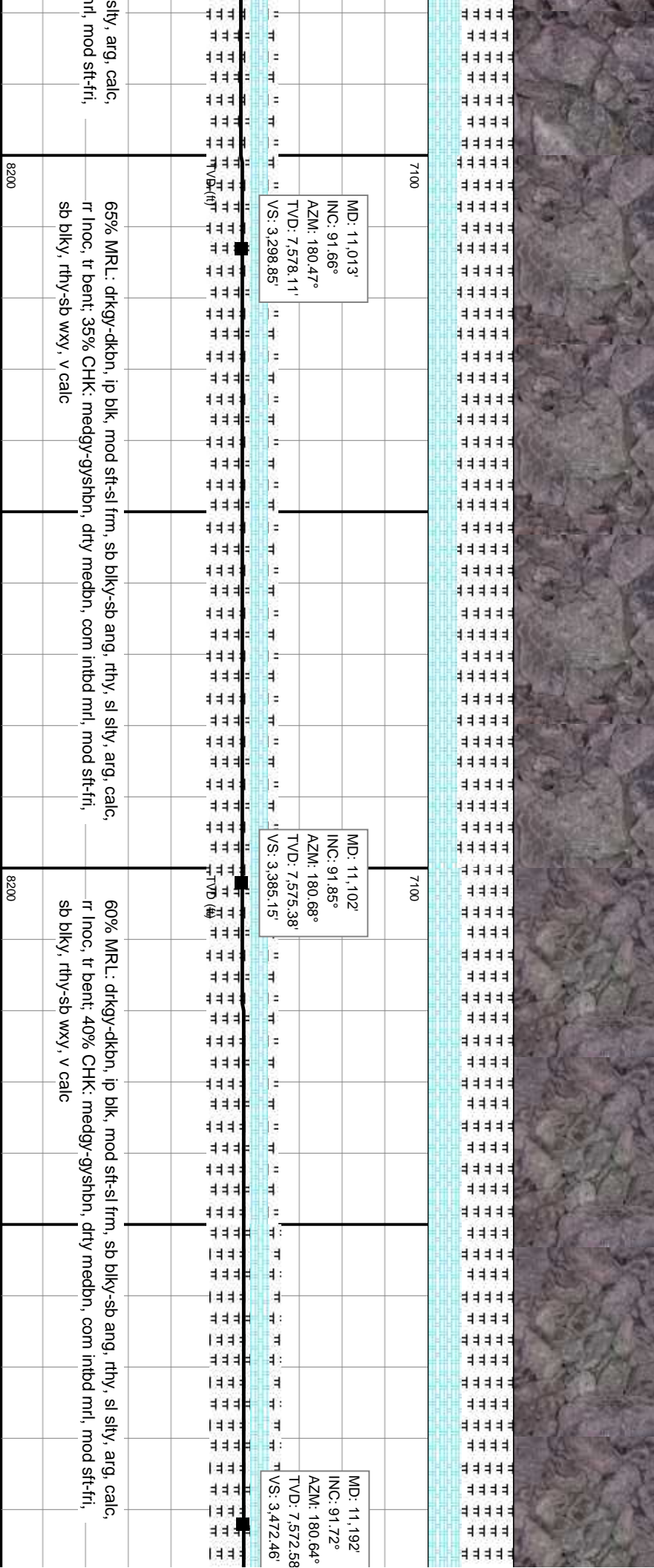
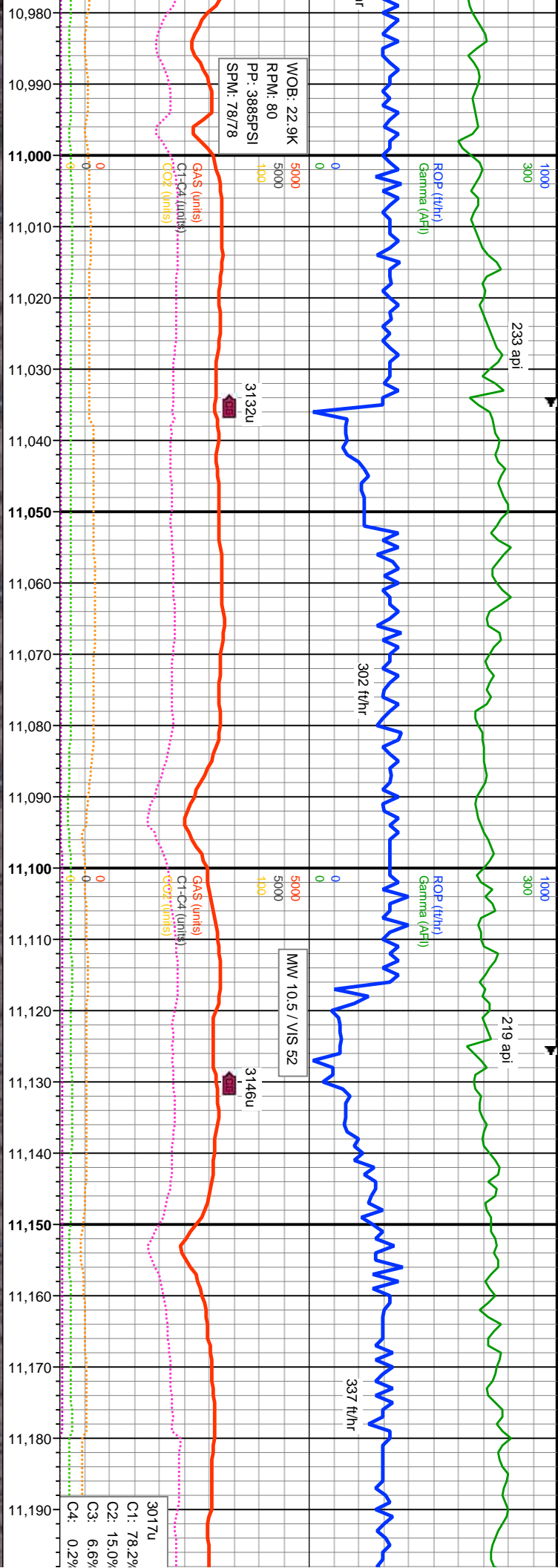
medgy-gyshbn, sme drty brn, tr inibd mrl, mod sft-fri, sb blkly, rthy-sb
r Inoc, tr bent, 45% MRL: drkgy-dkbn, mod sft-sl frm, sb blkly-sb ang,
arg, calc

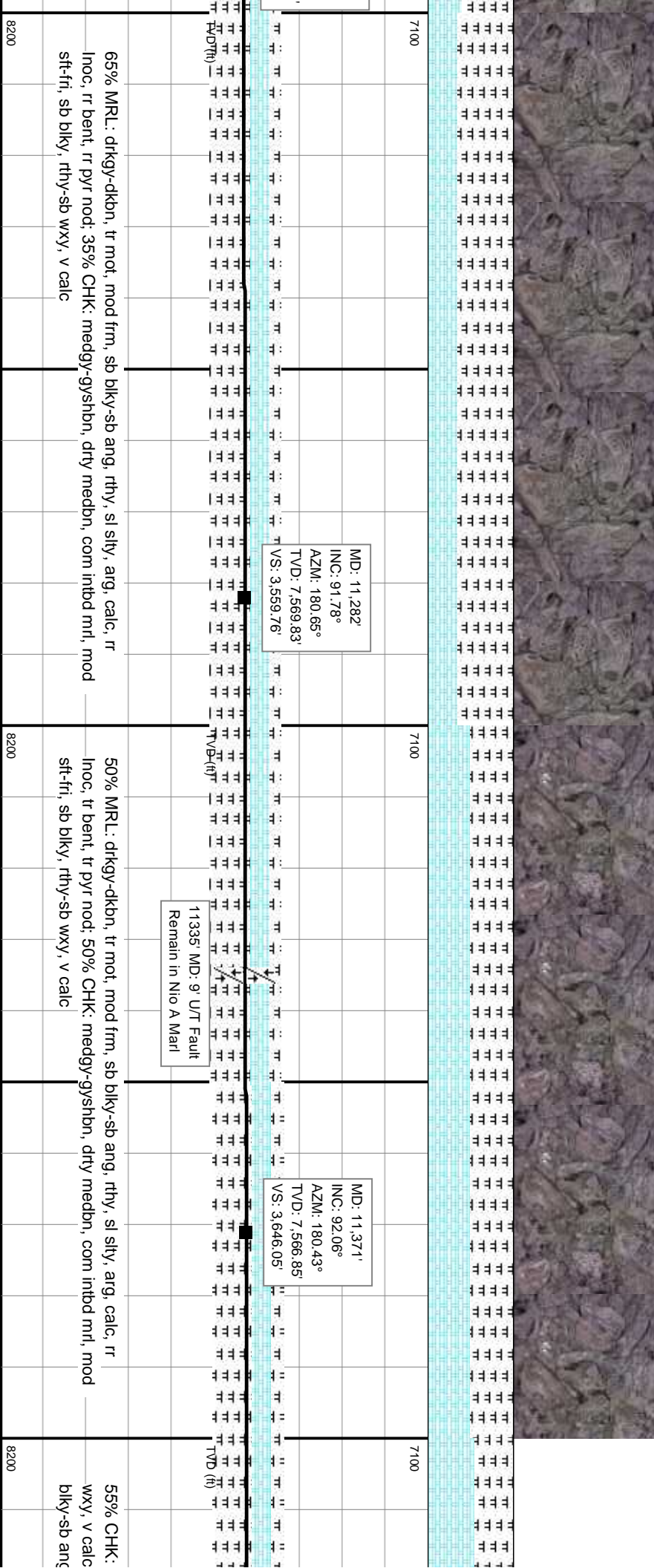
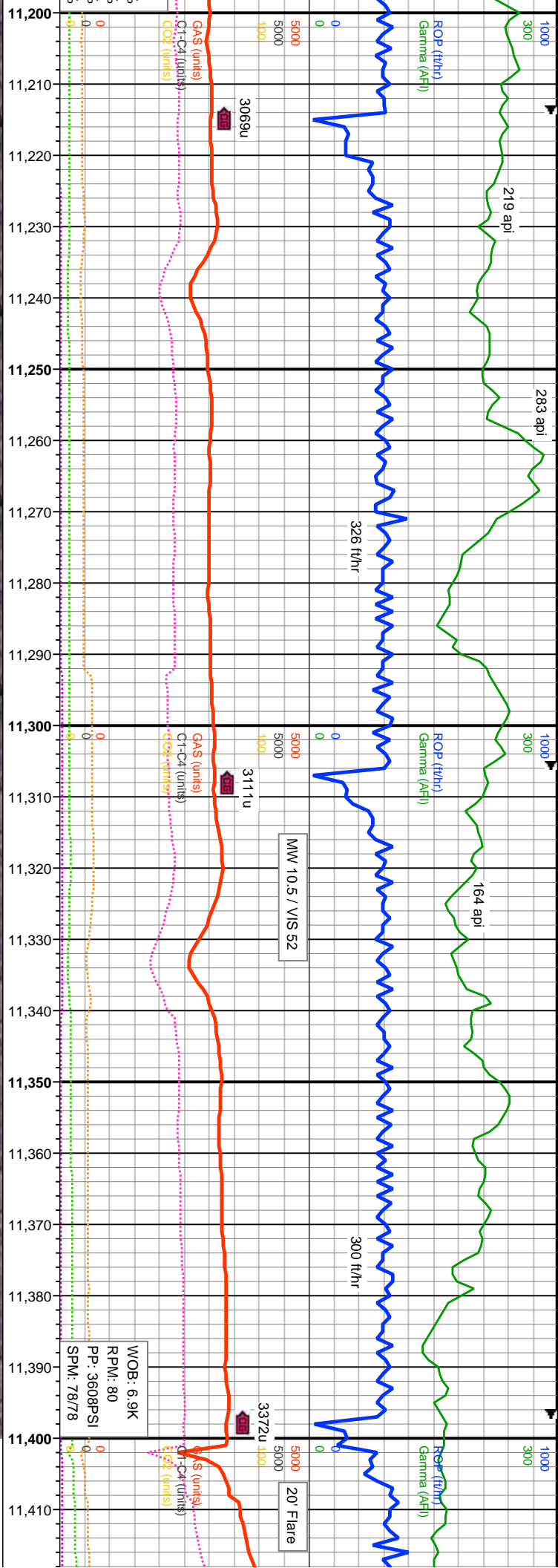
60% CHK: medgy-gyshbn, sme drty brn, tr inibd mrl, mod sft-fri, sb blkly, rthy-sb
wxy, v calc, 40% MRL: drkgy-dkbn, mod sft-sl frm, sb blkly-sb ang, rthy, sl slty, arg,
calc

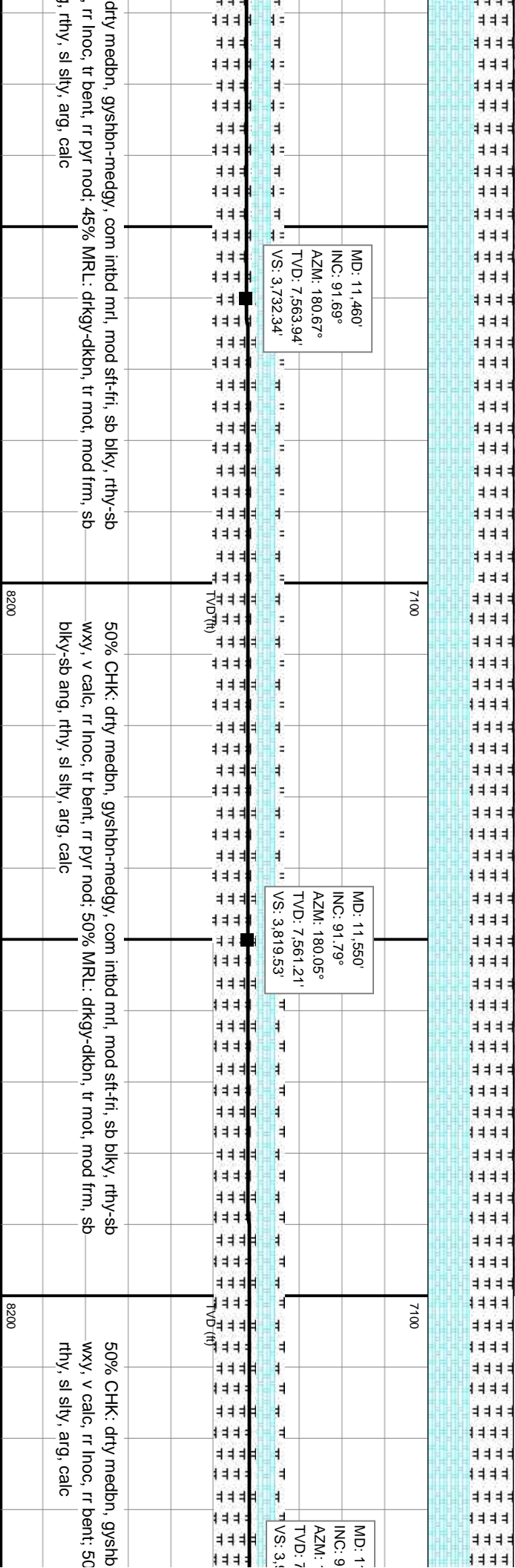
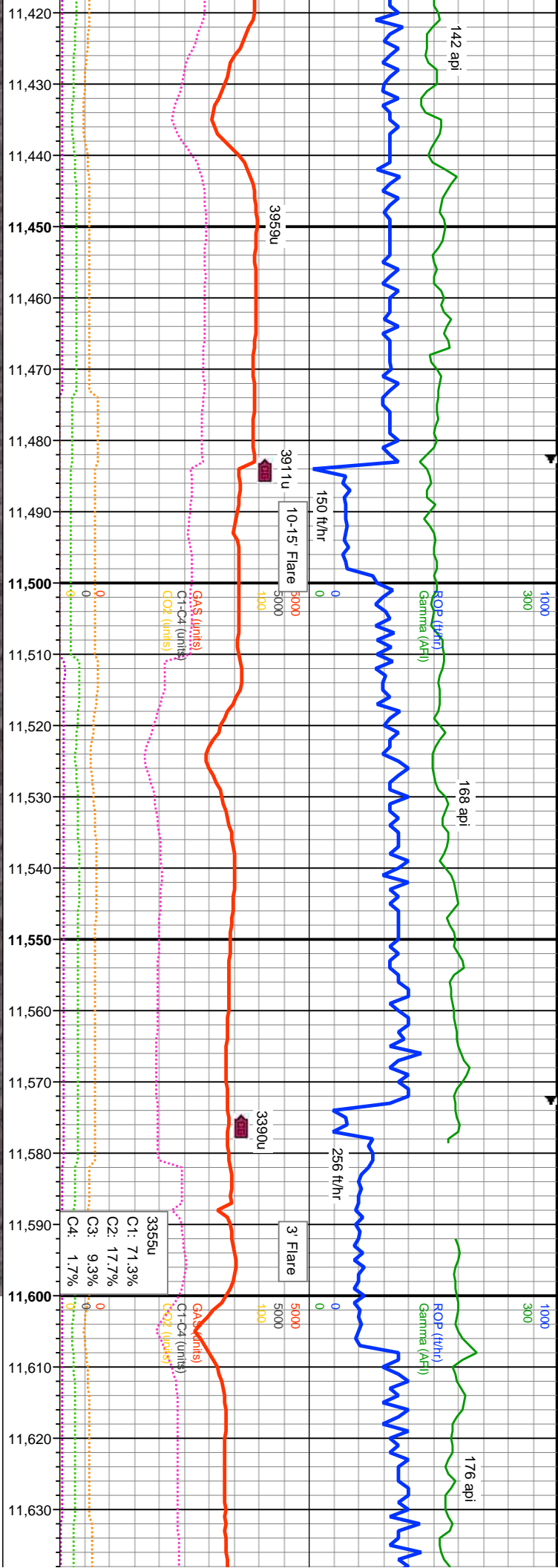
55% CHK: medgy-gyshbn, sme drty brn, tr inibd mrl, mod sft-fri, sb blkly, rthy-sb
wxy, v calc, 40% MRL: drkgy-dkbn, mod sft-sl frm, sb blkly-sb ang, rthy, sl slty, arg, calc

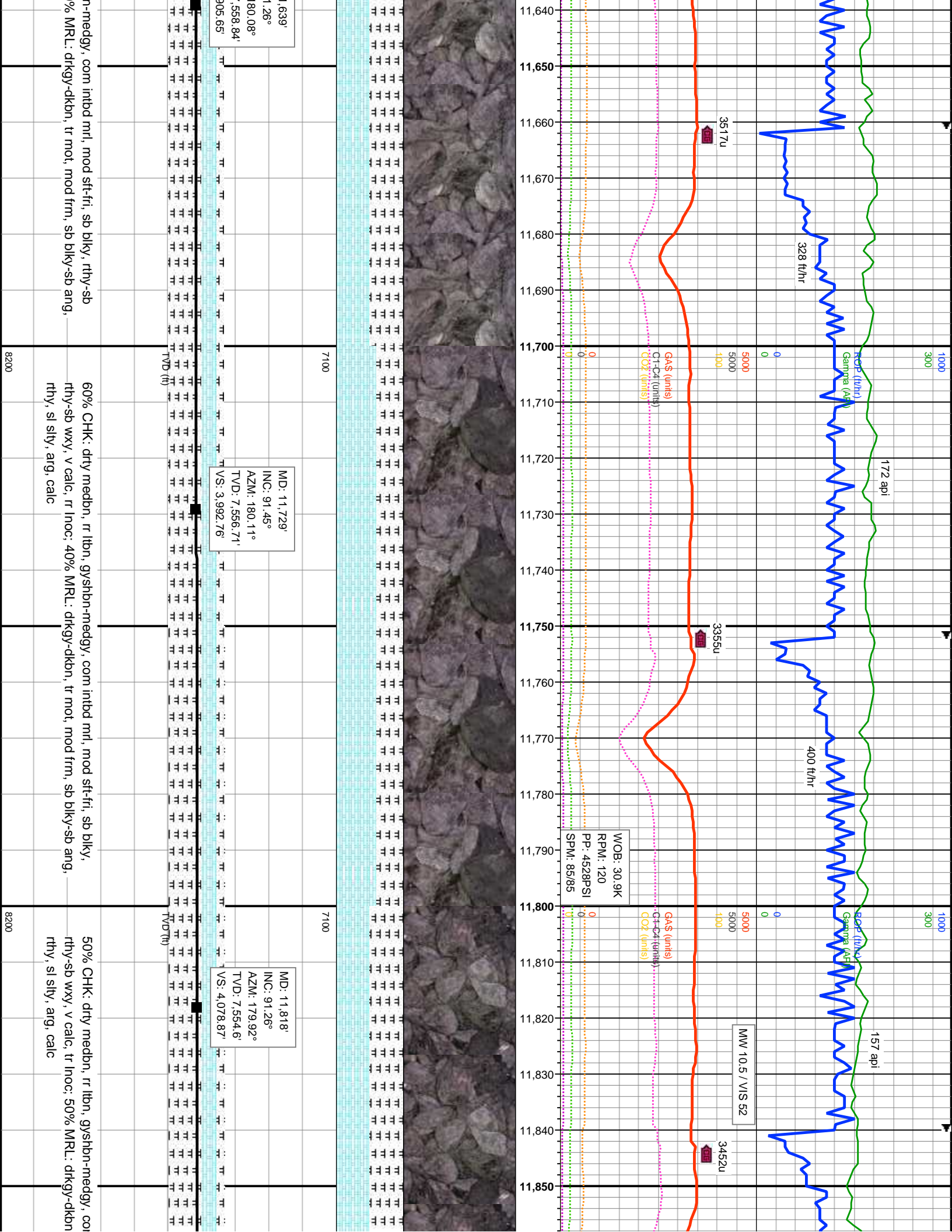


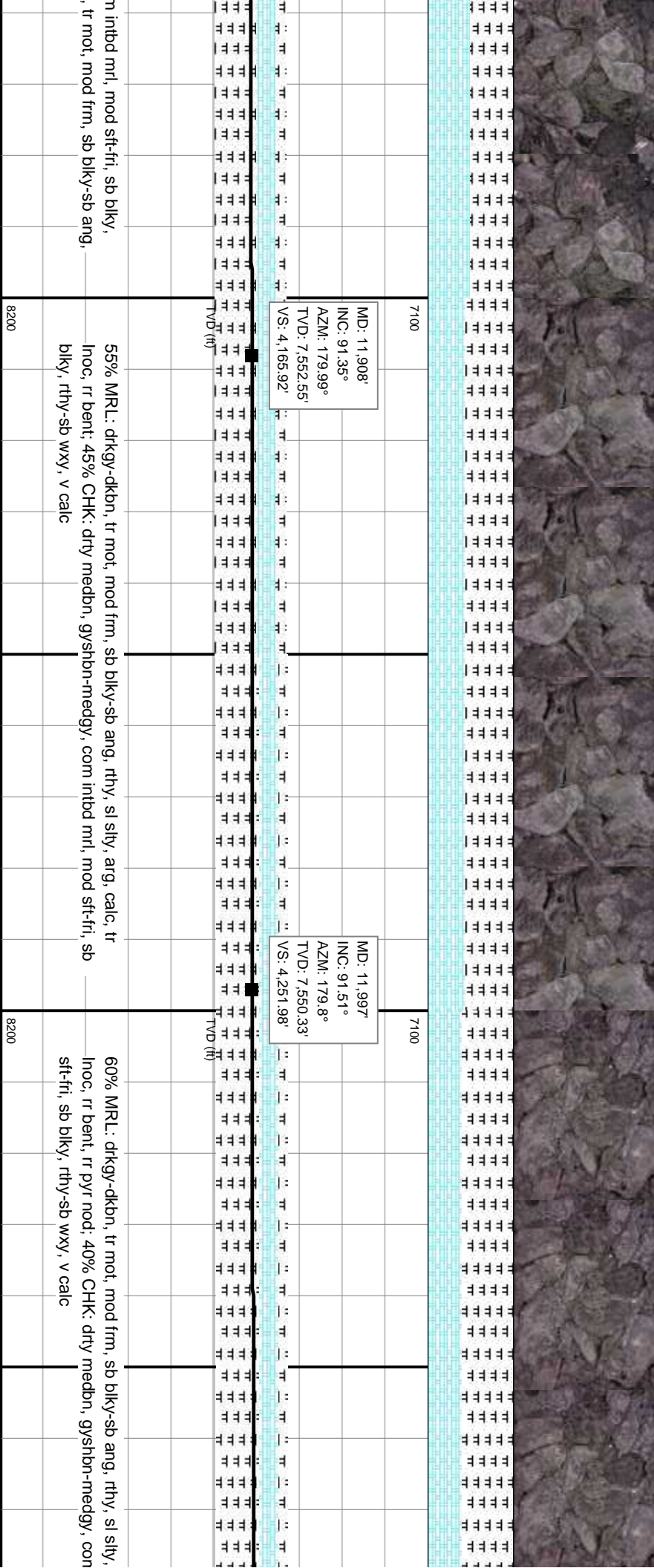
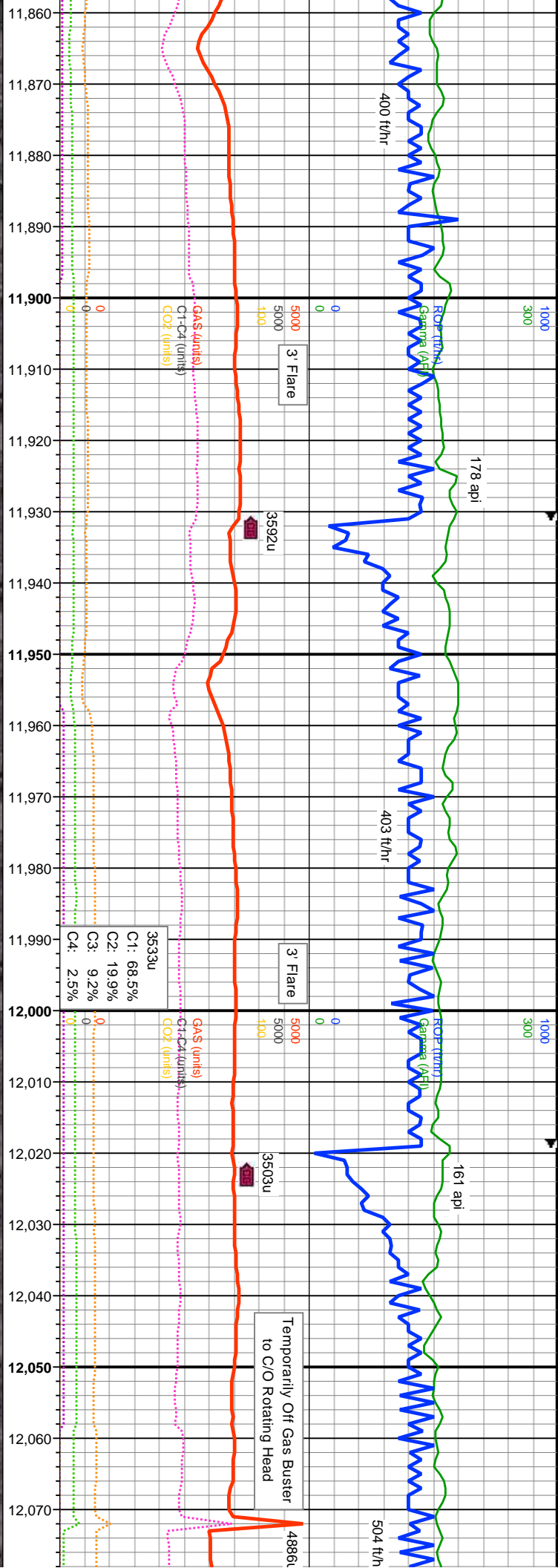


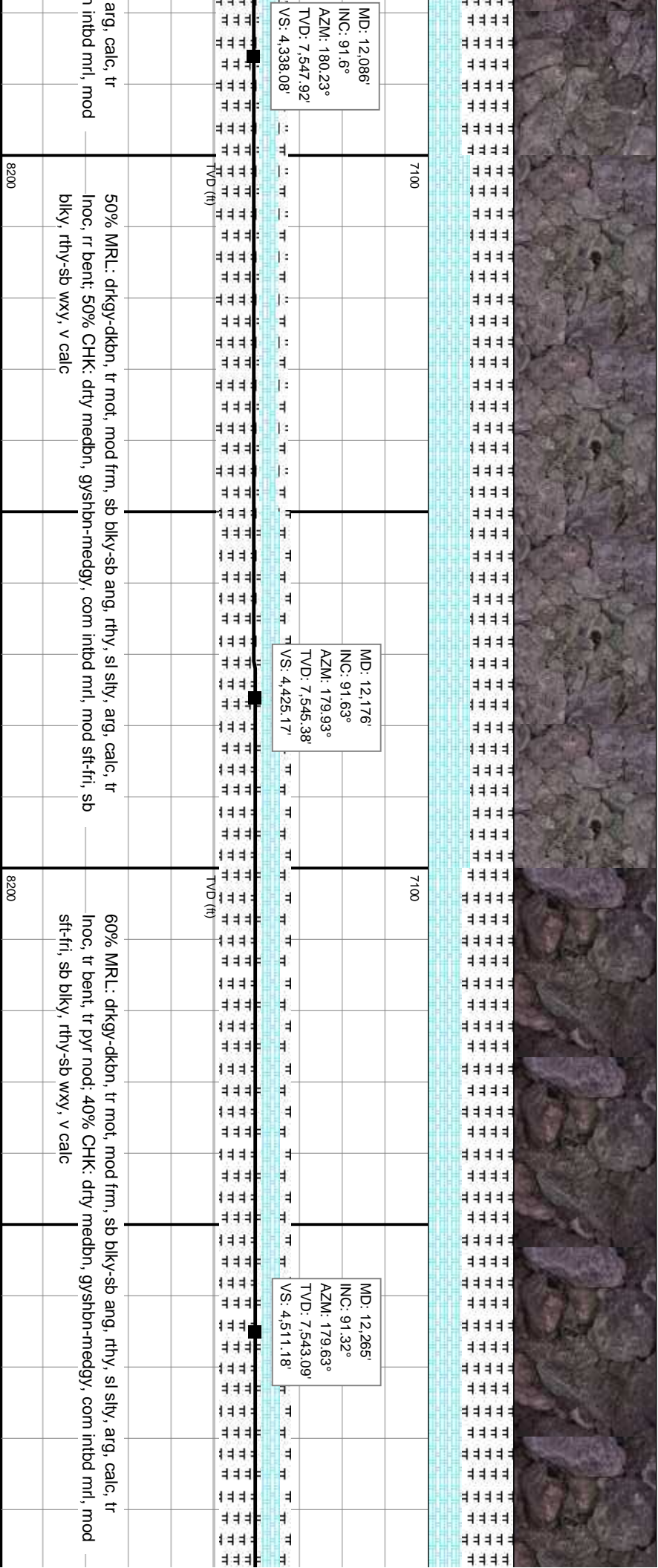
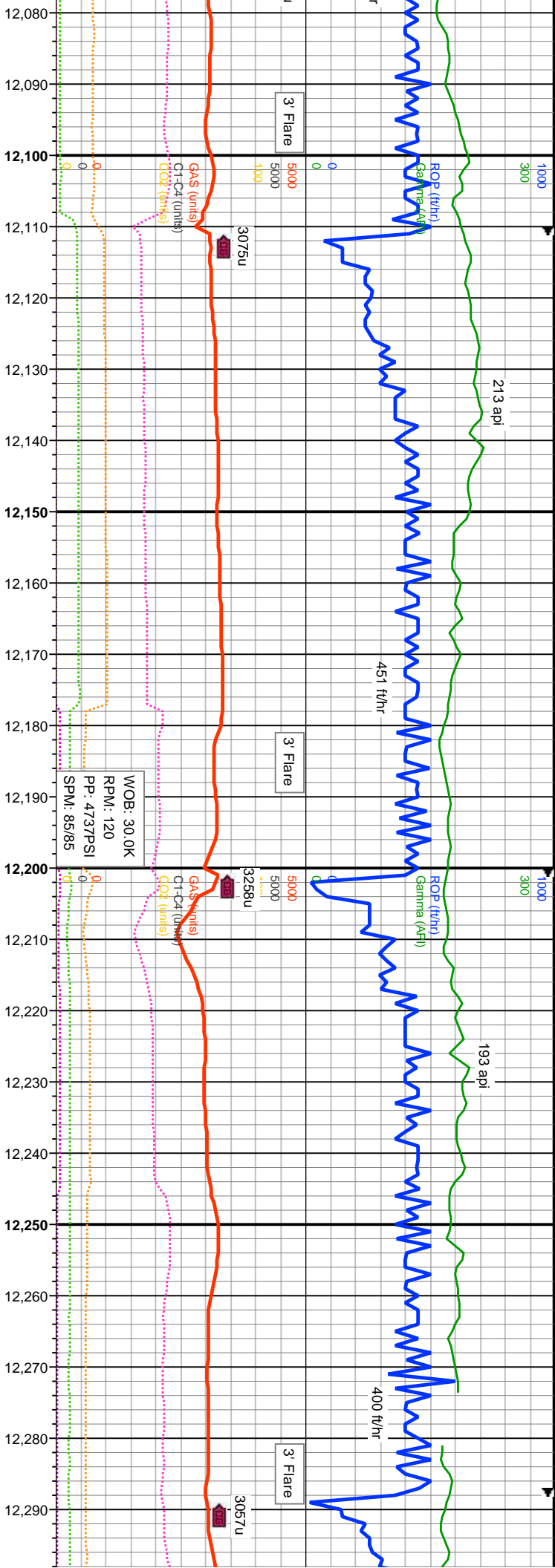


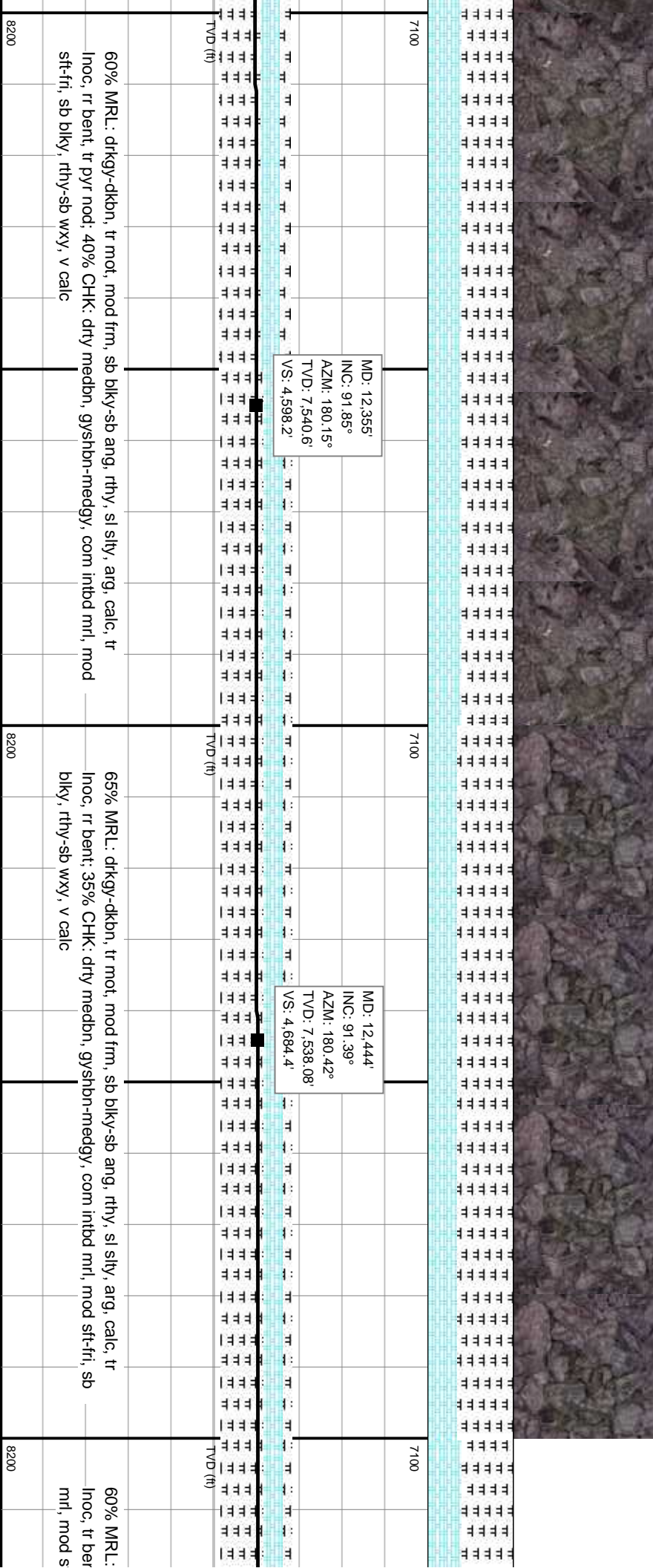
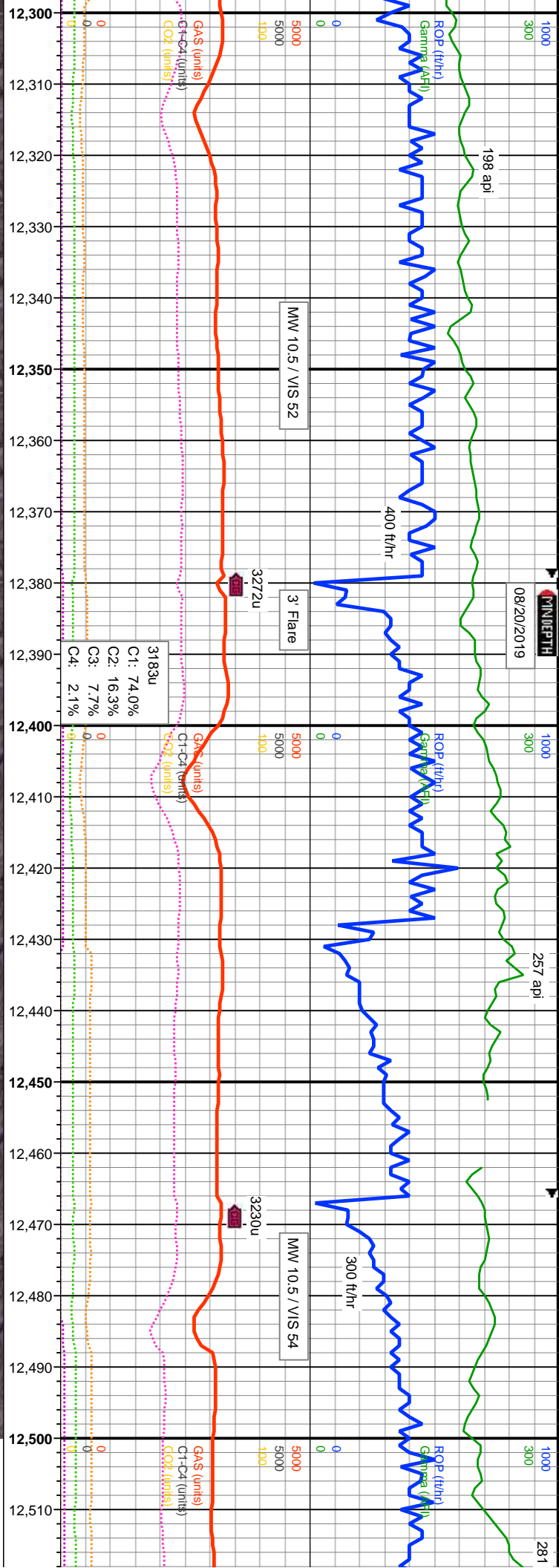


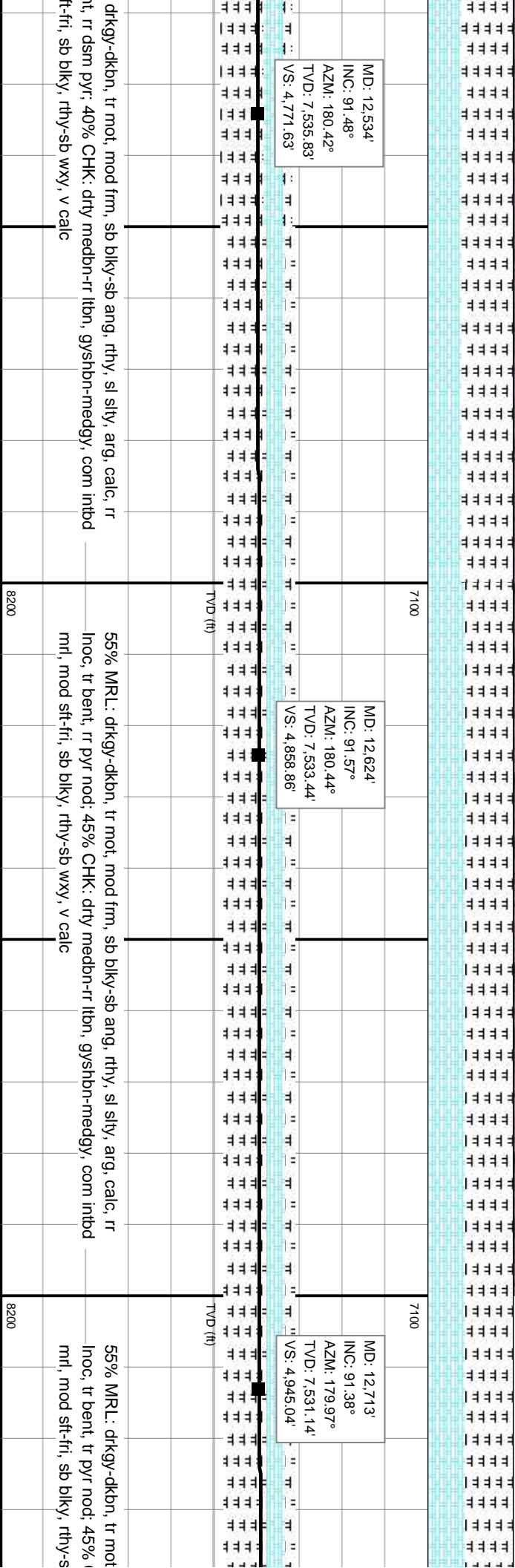
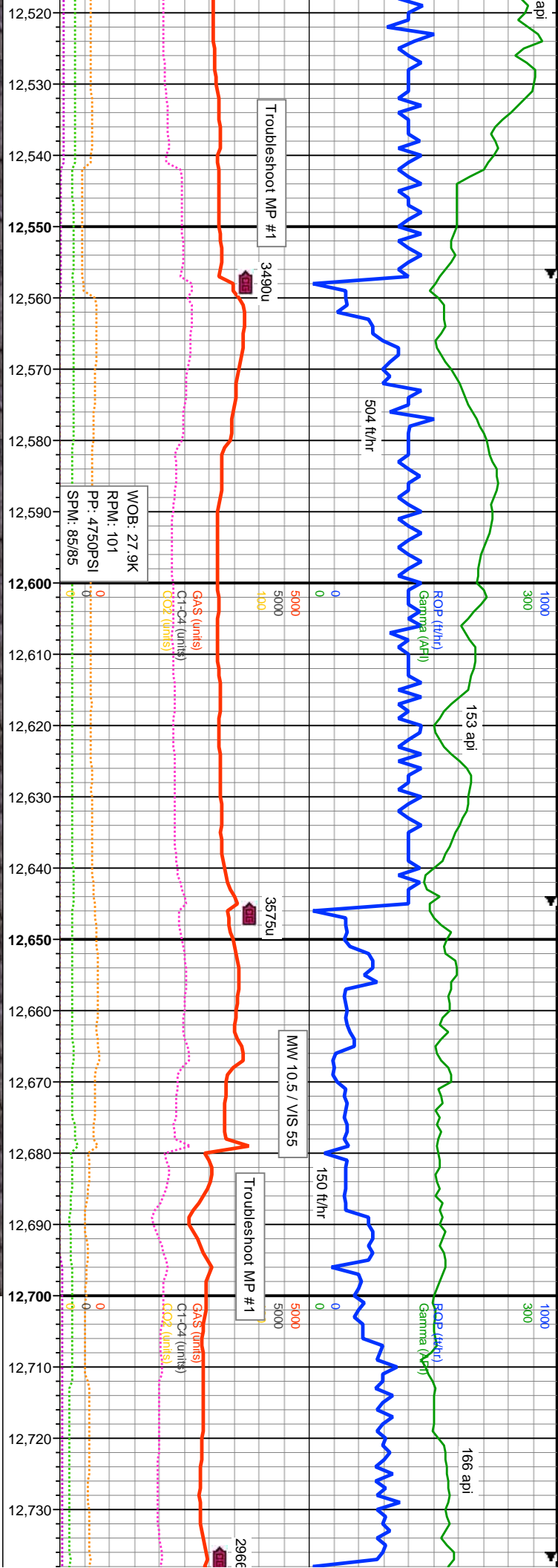


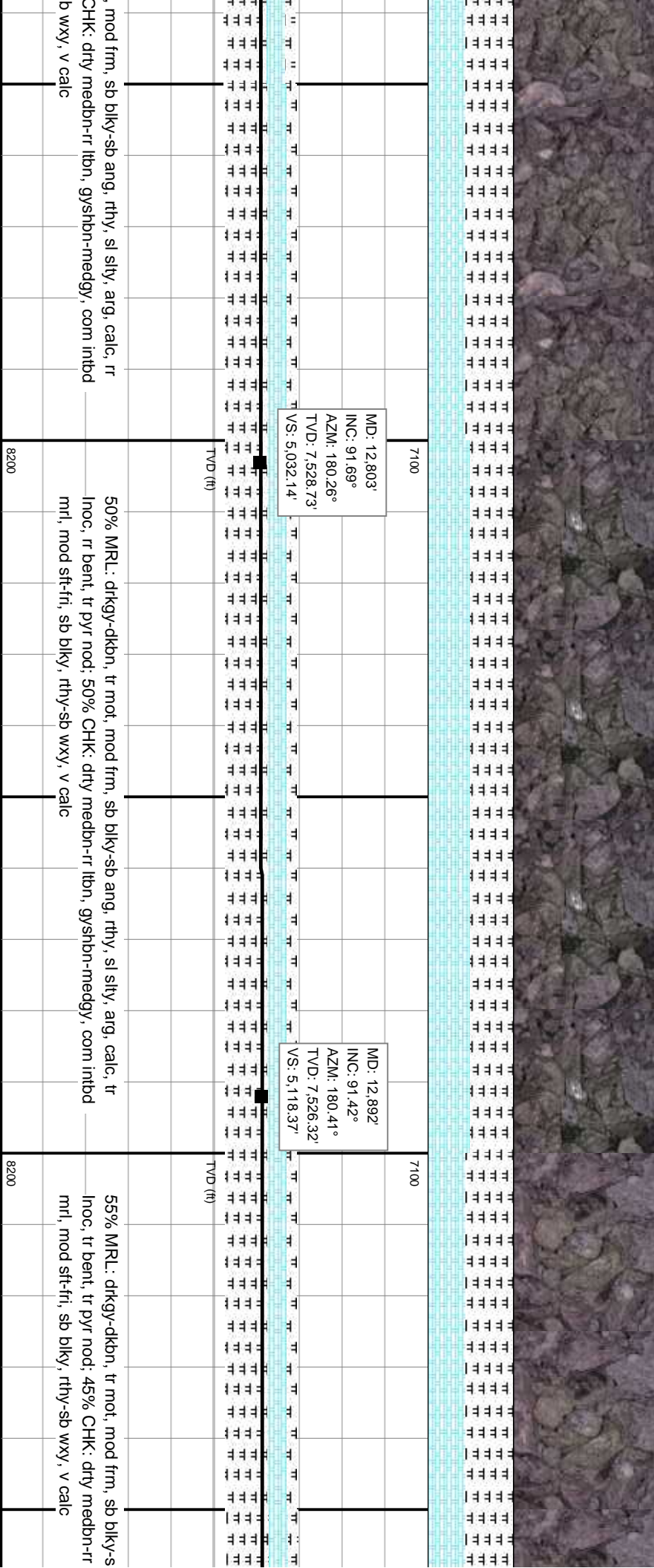
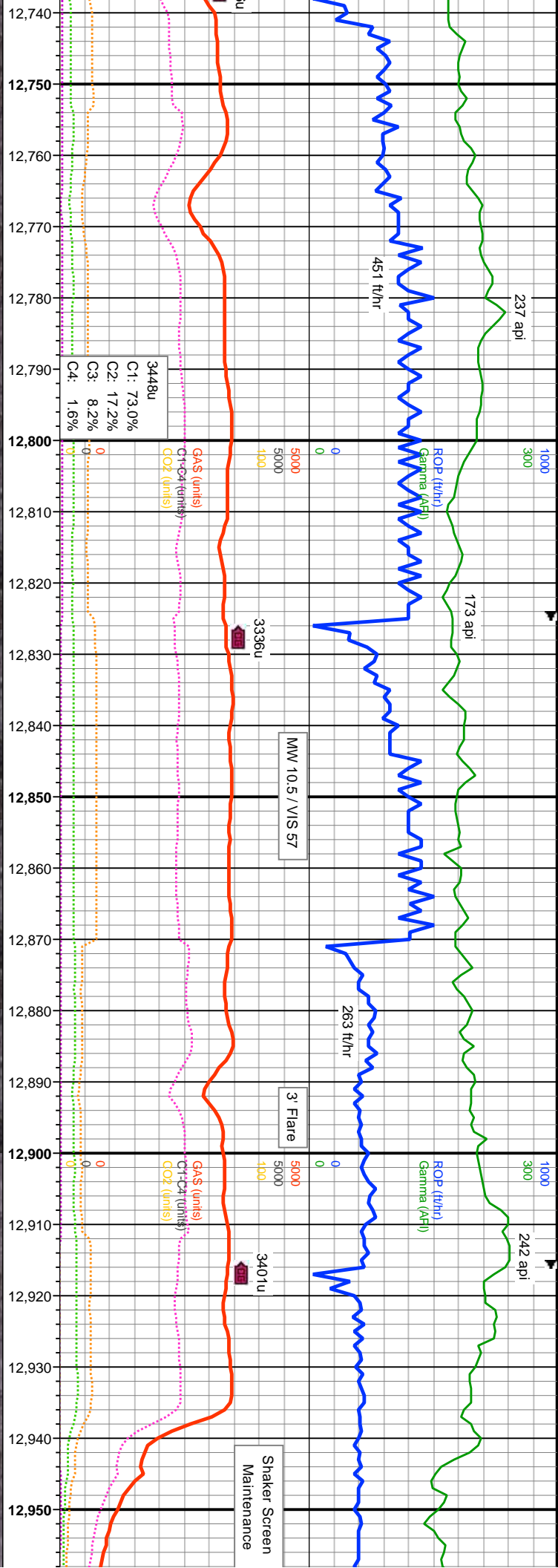


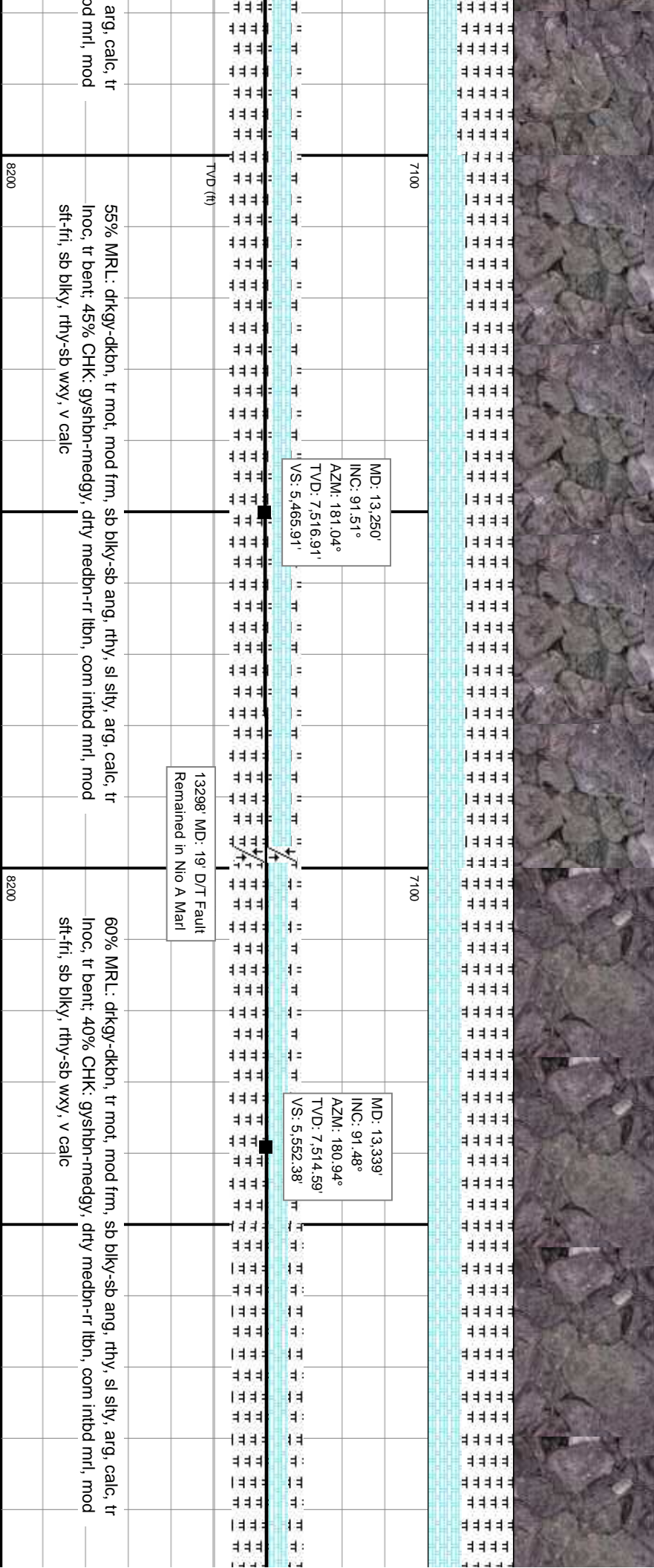
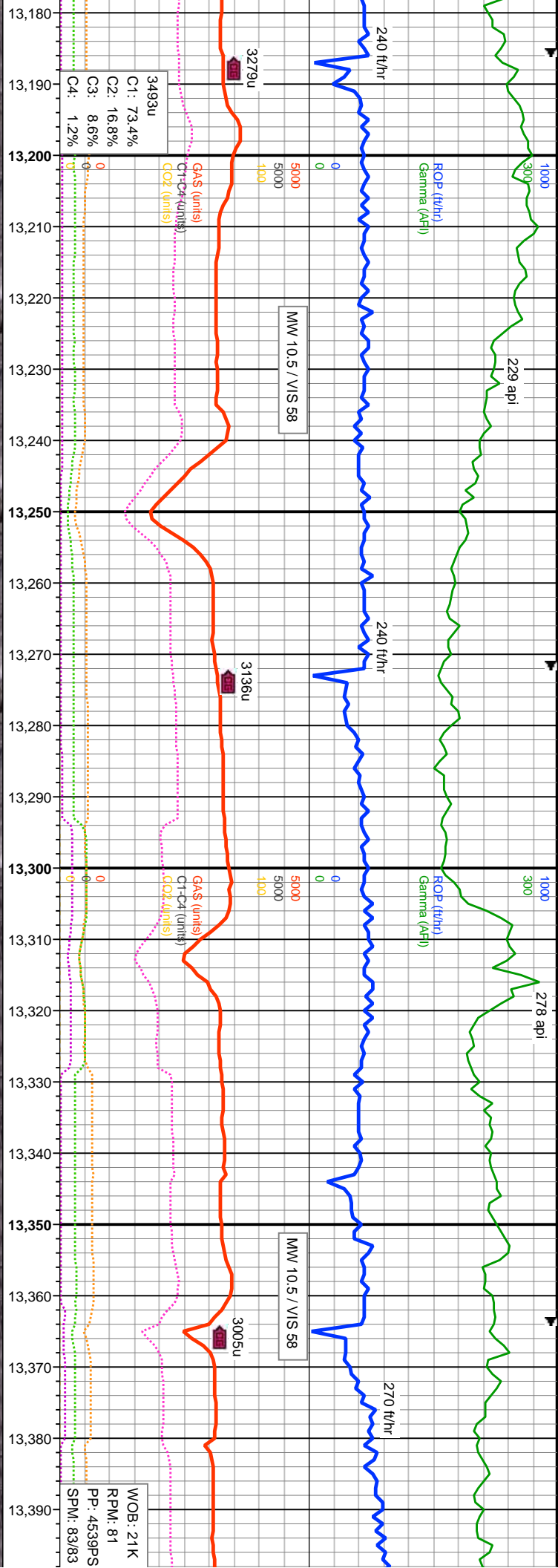


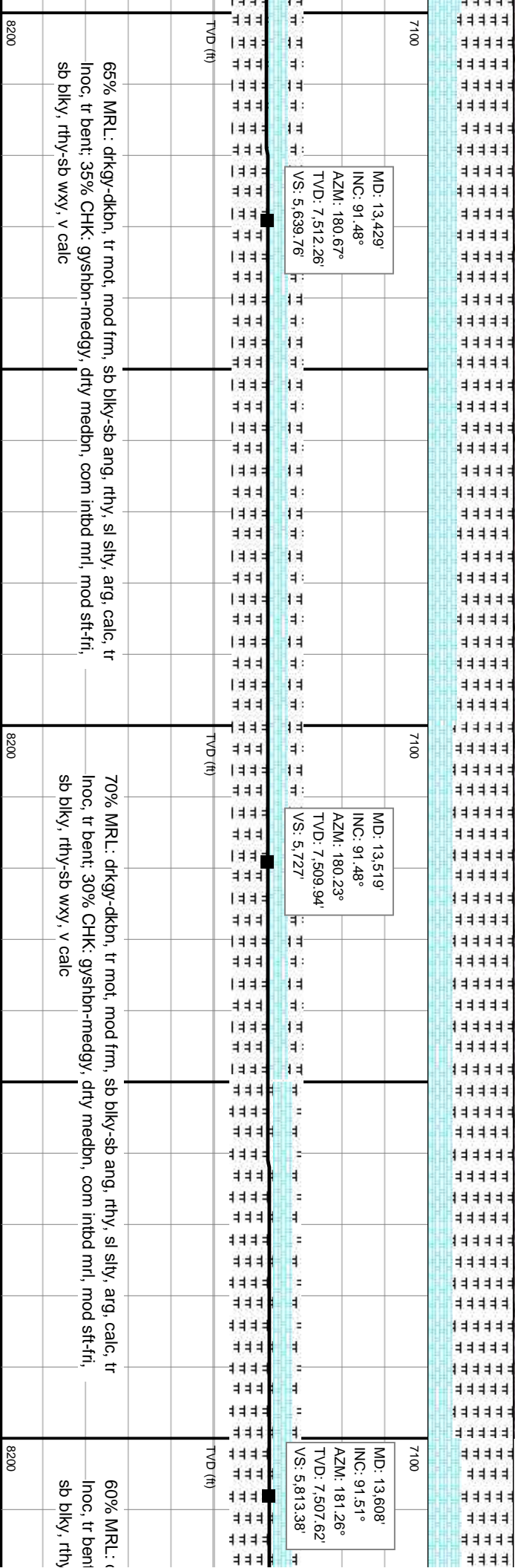
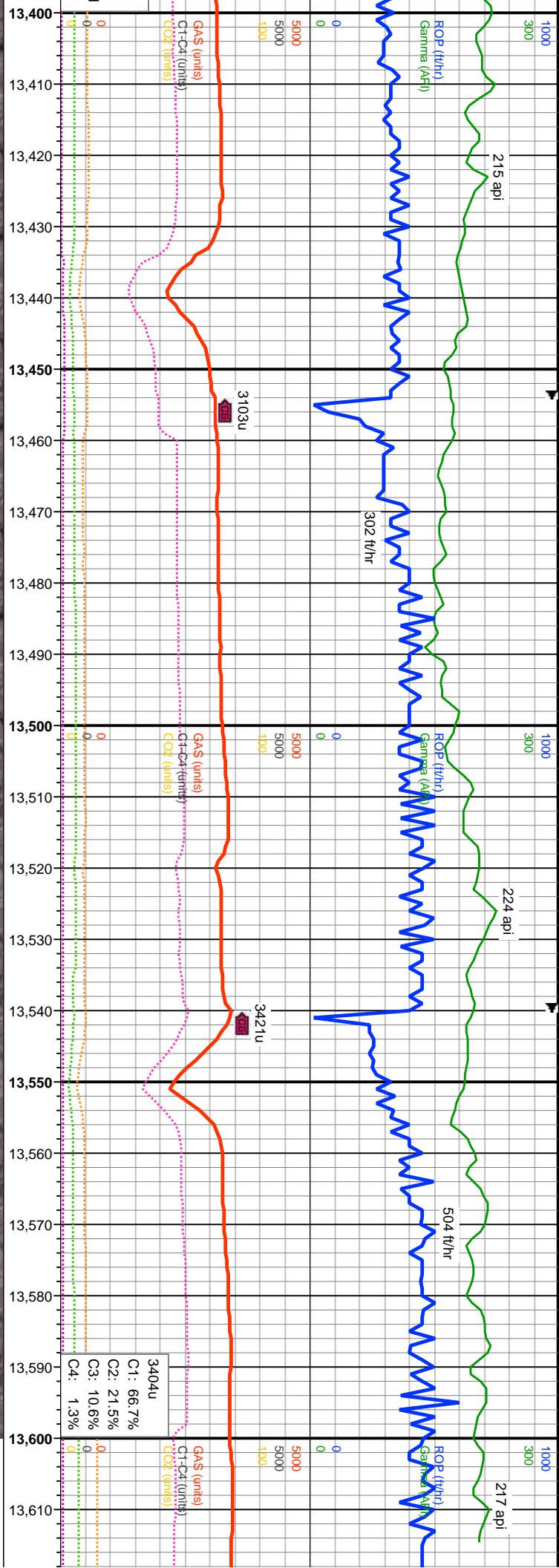


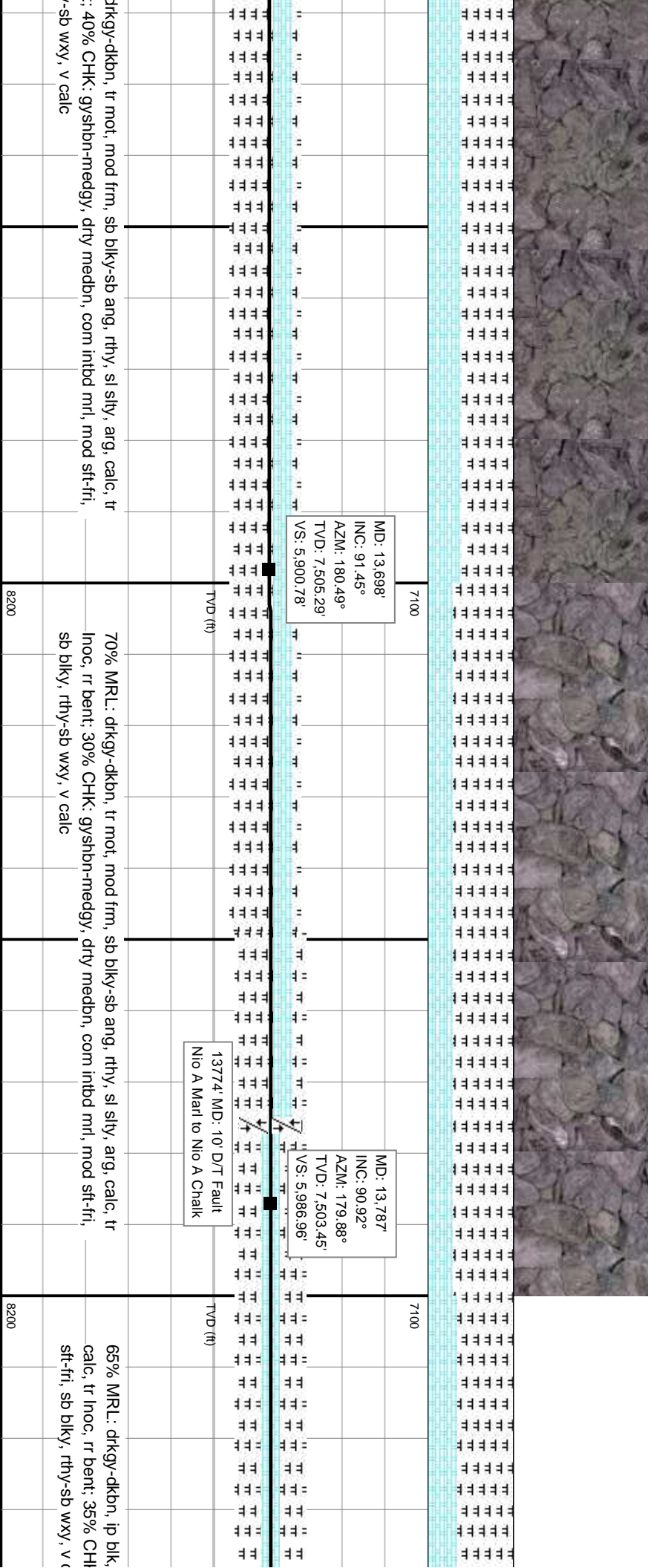
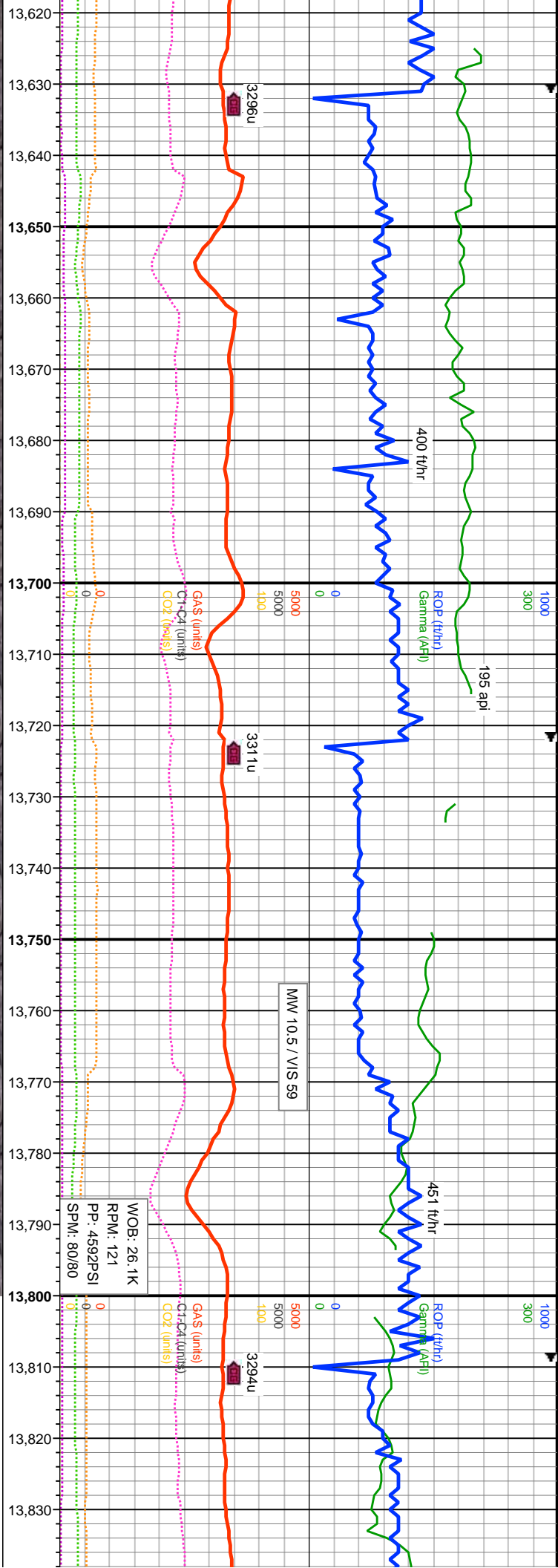


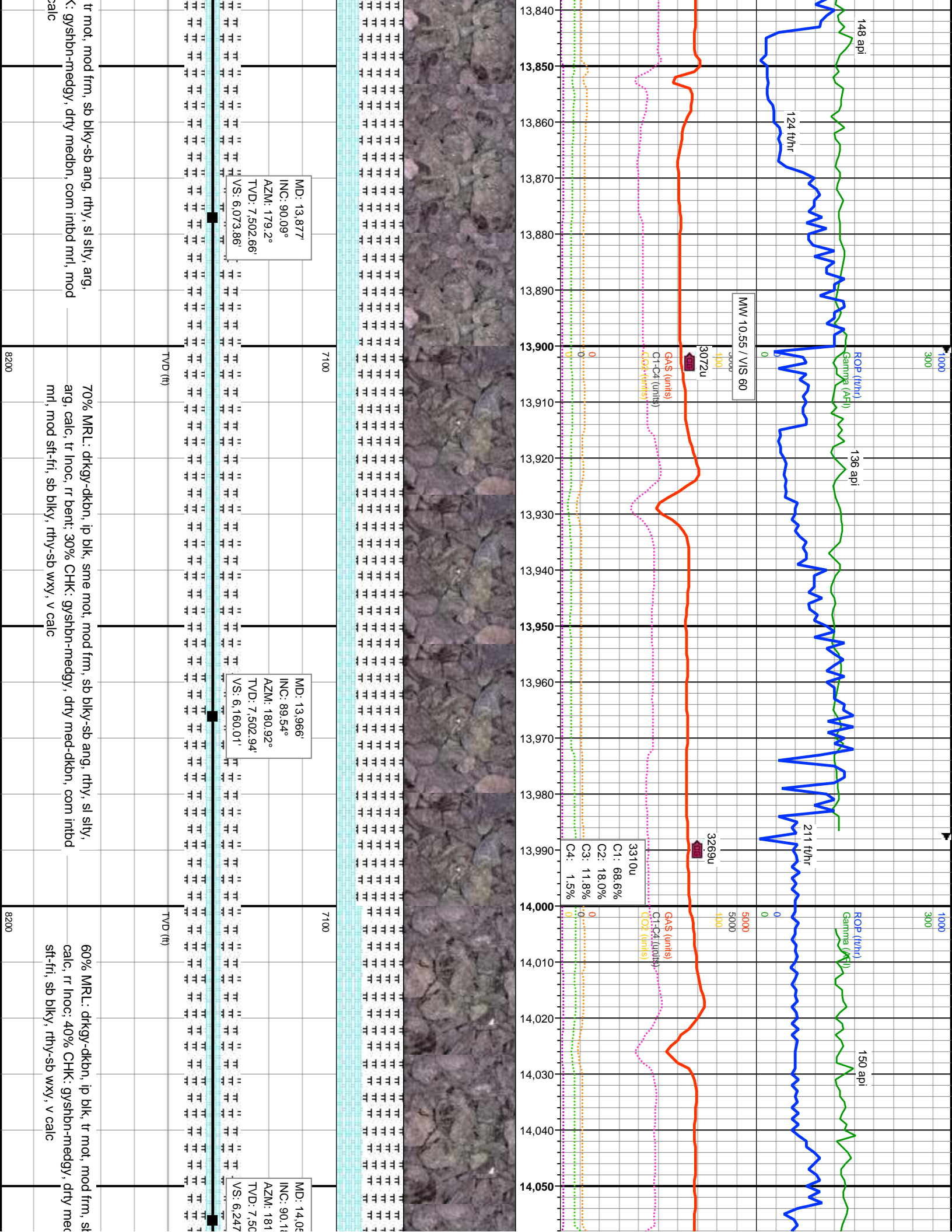


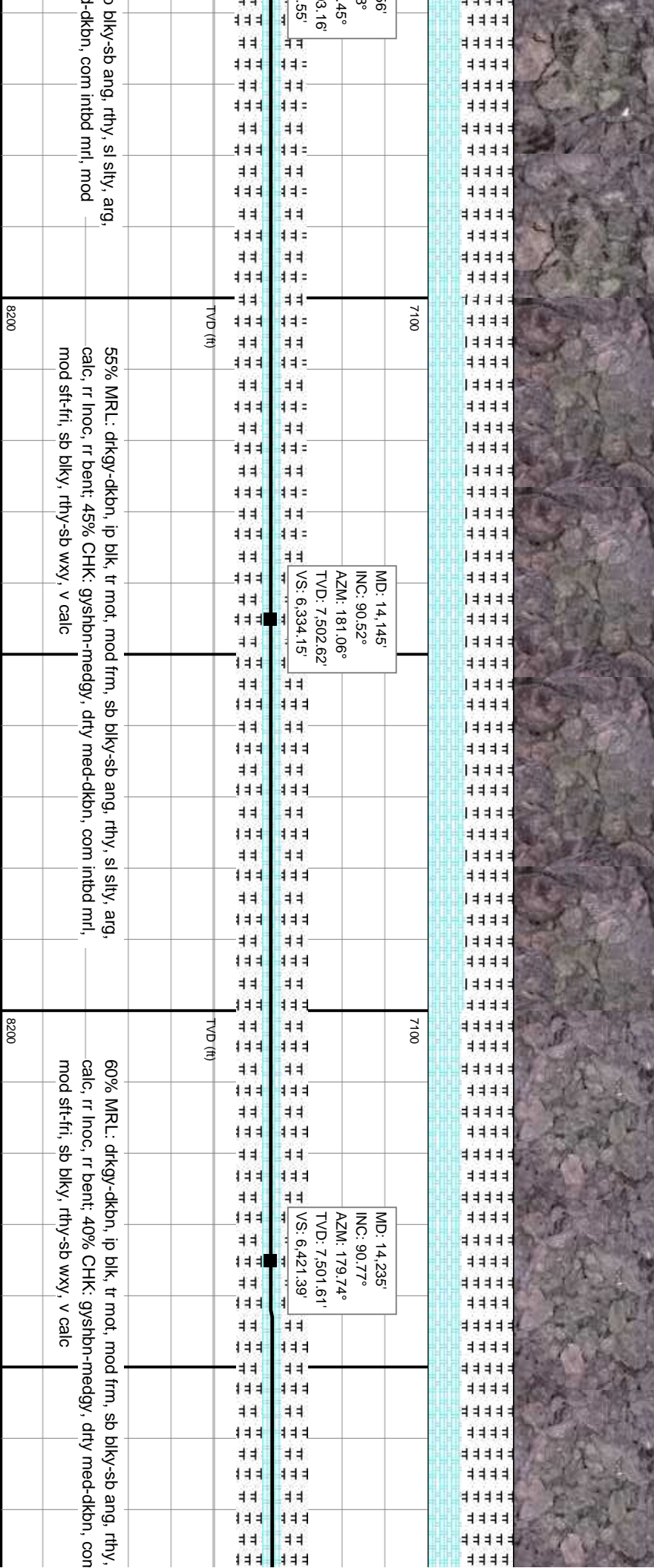
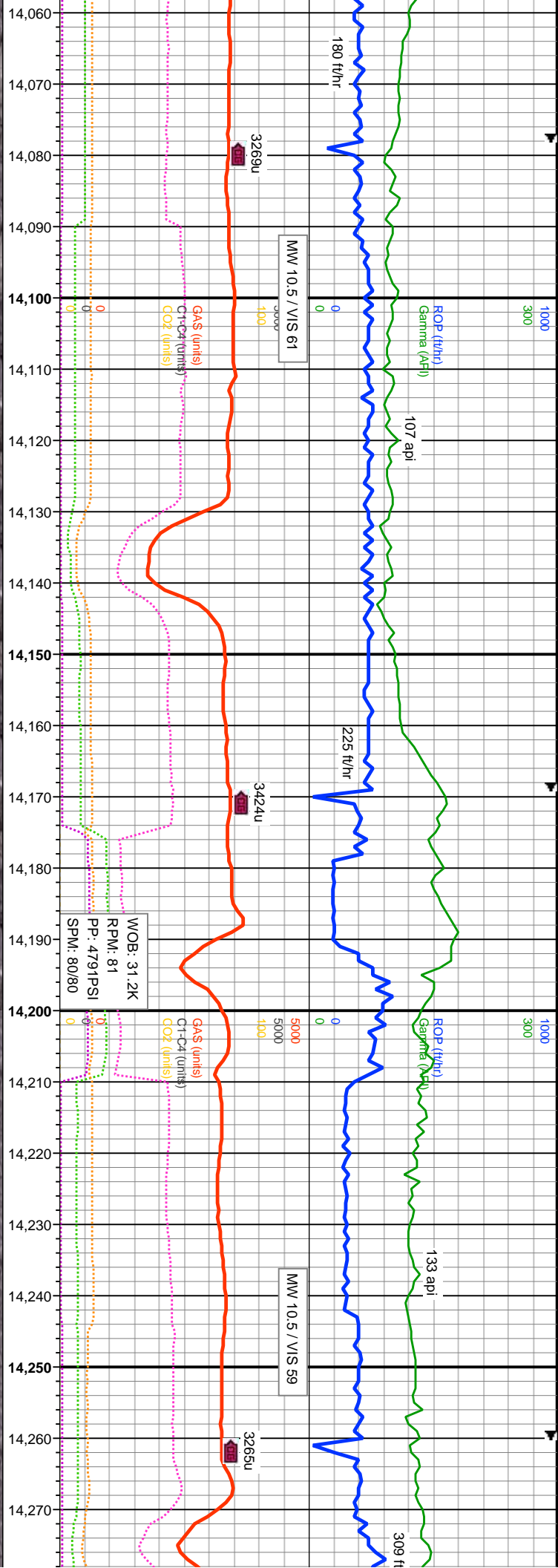


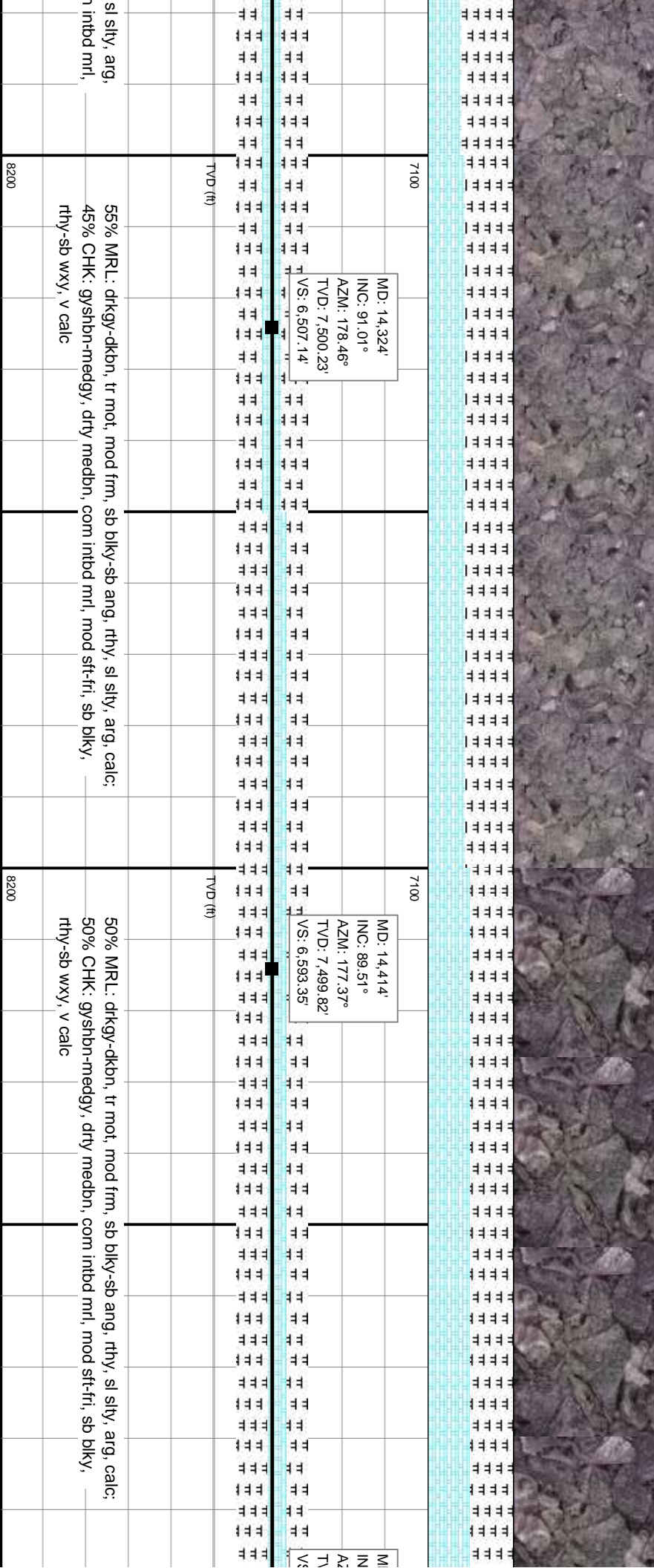
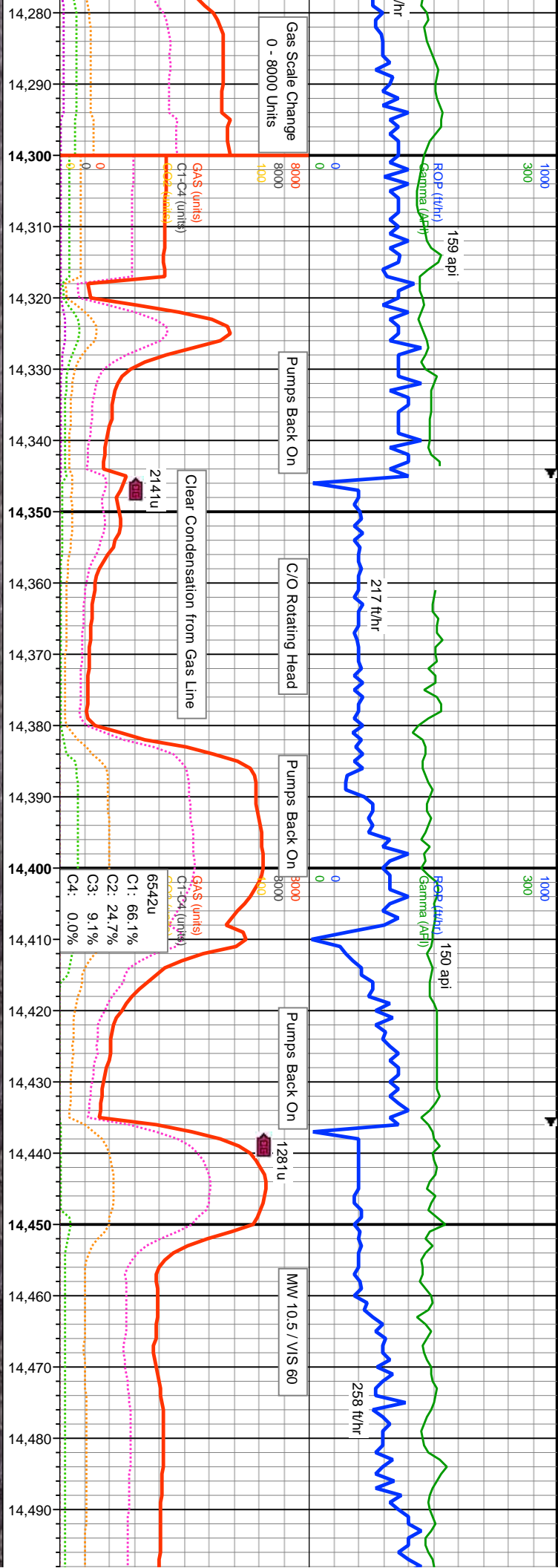


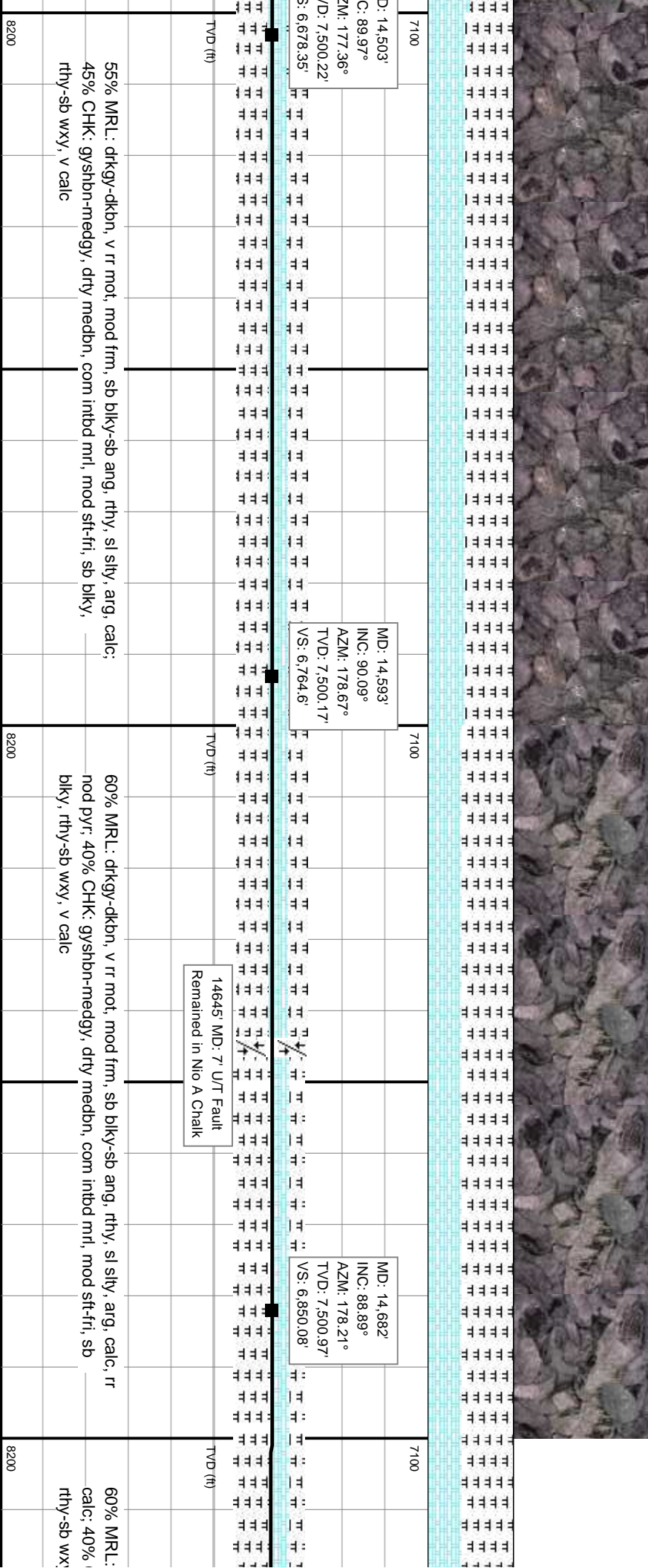
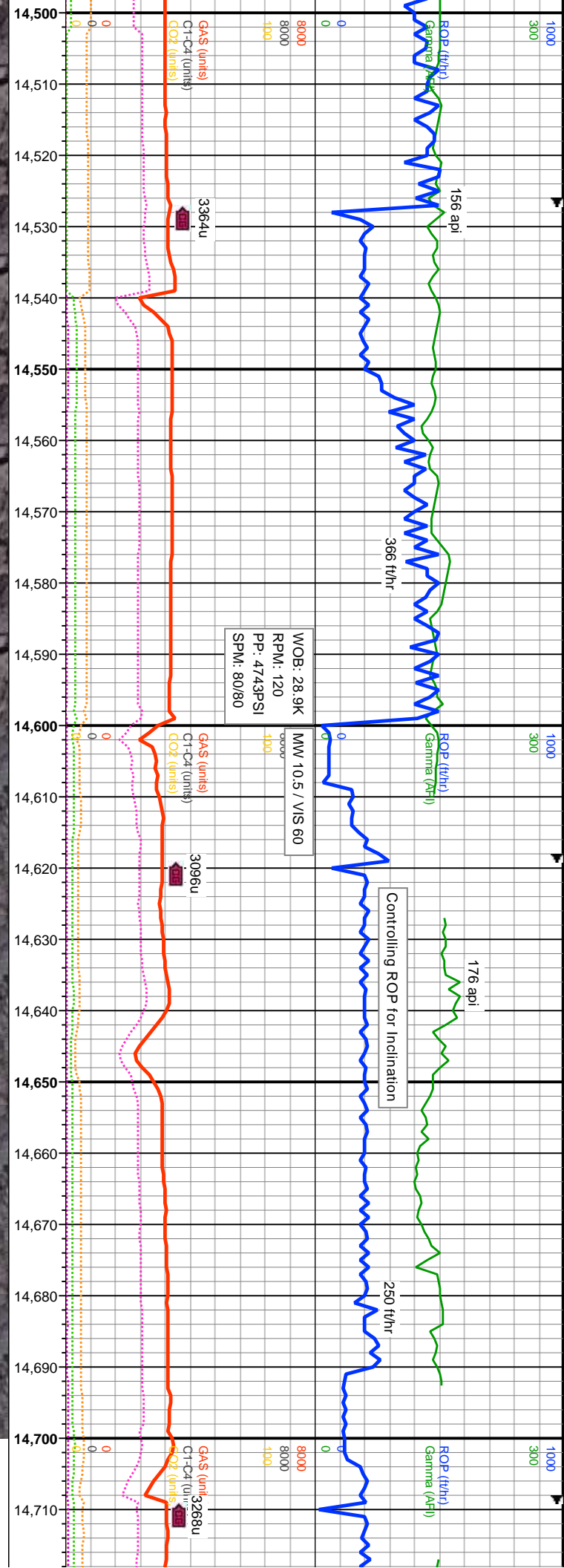


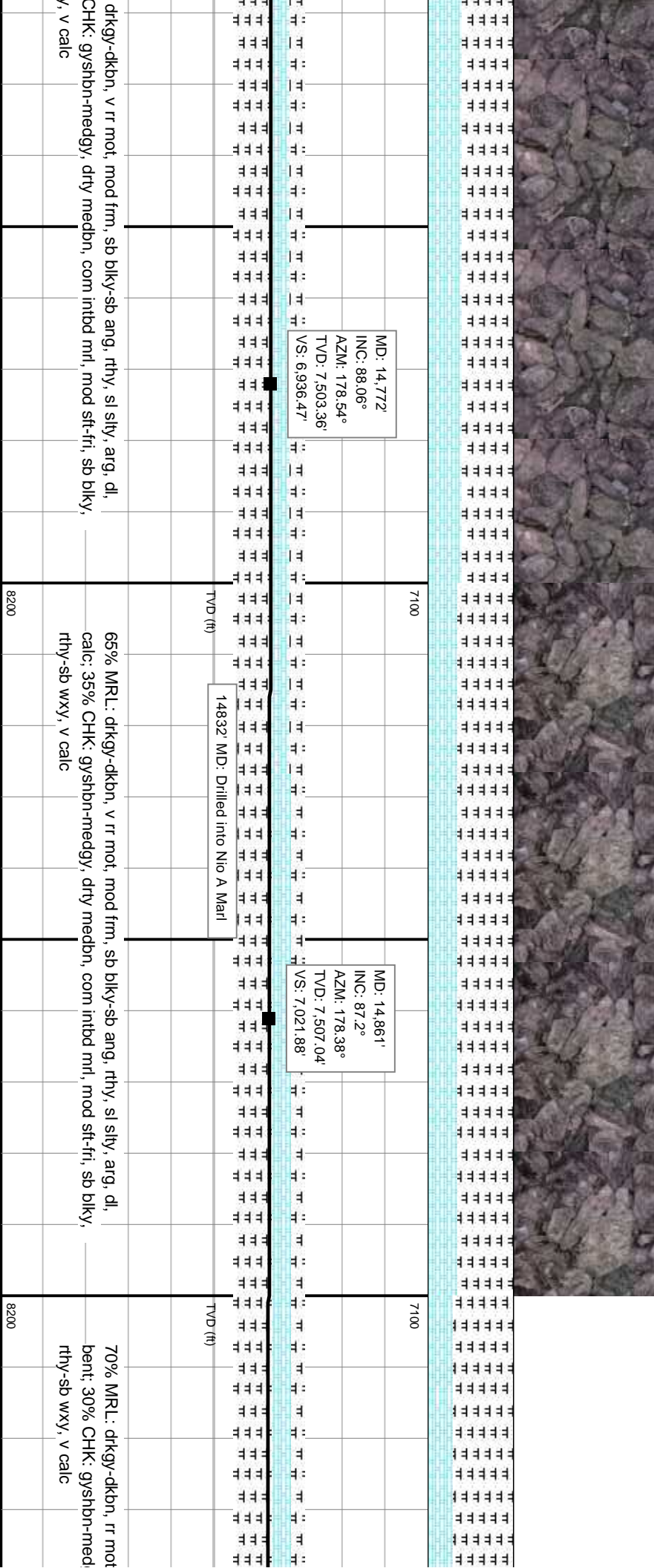
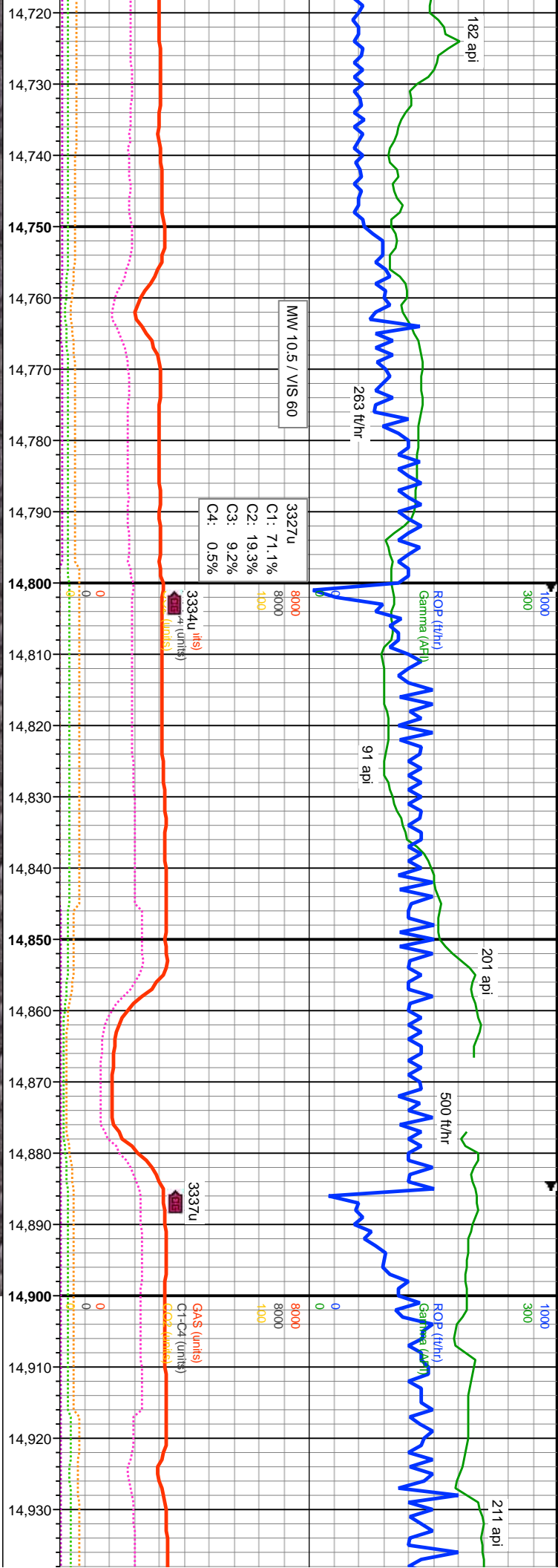


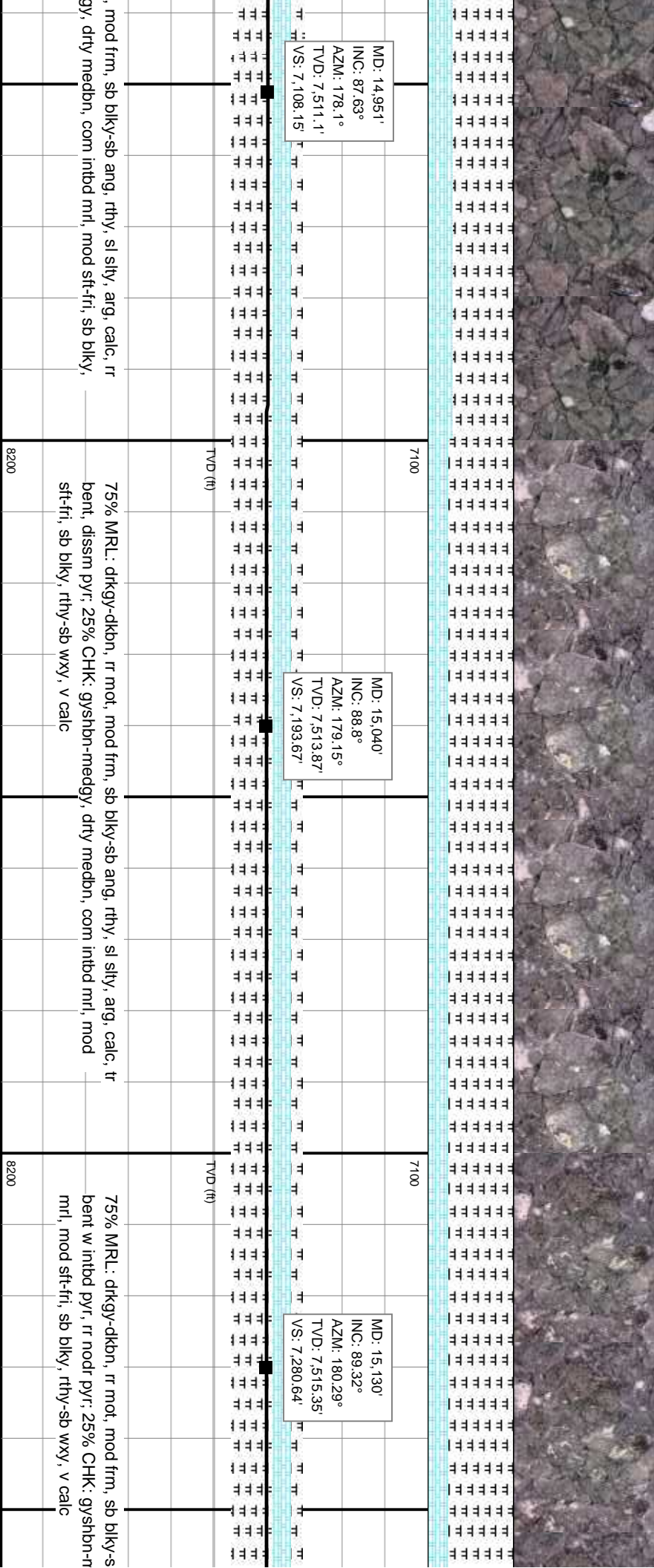
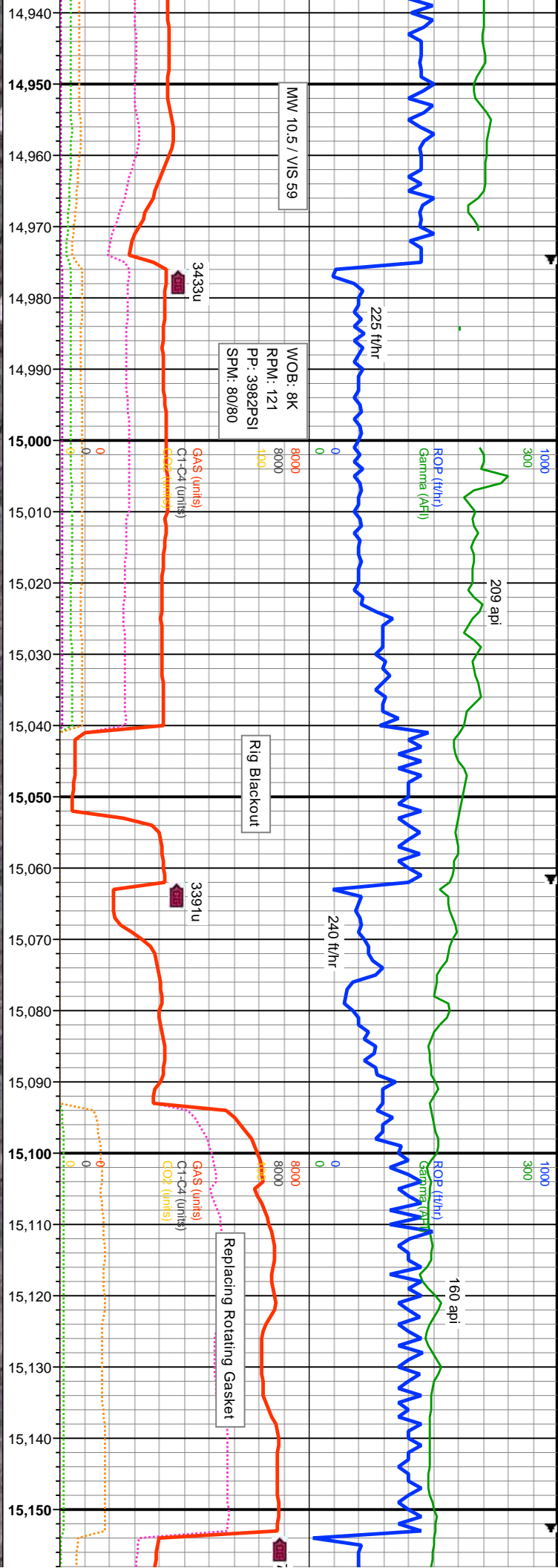


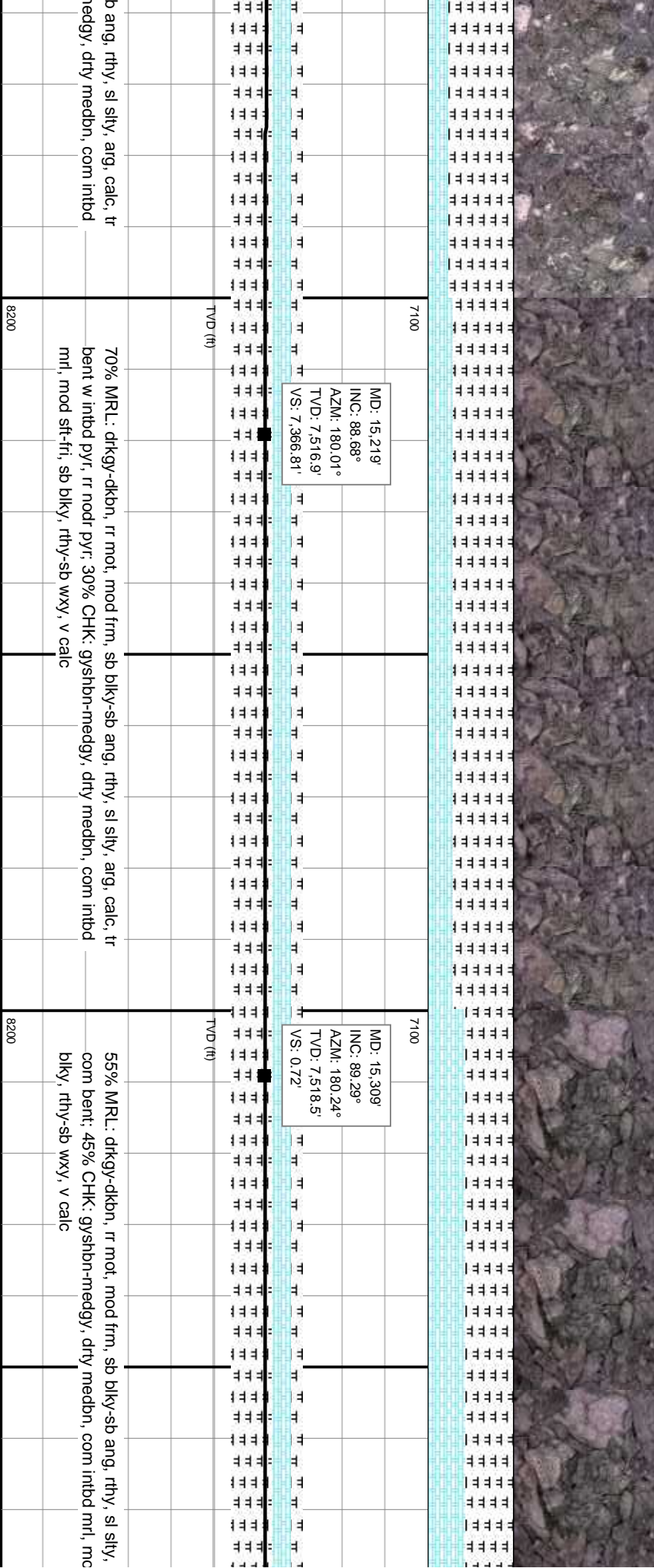
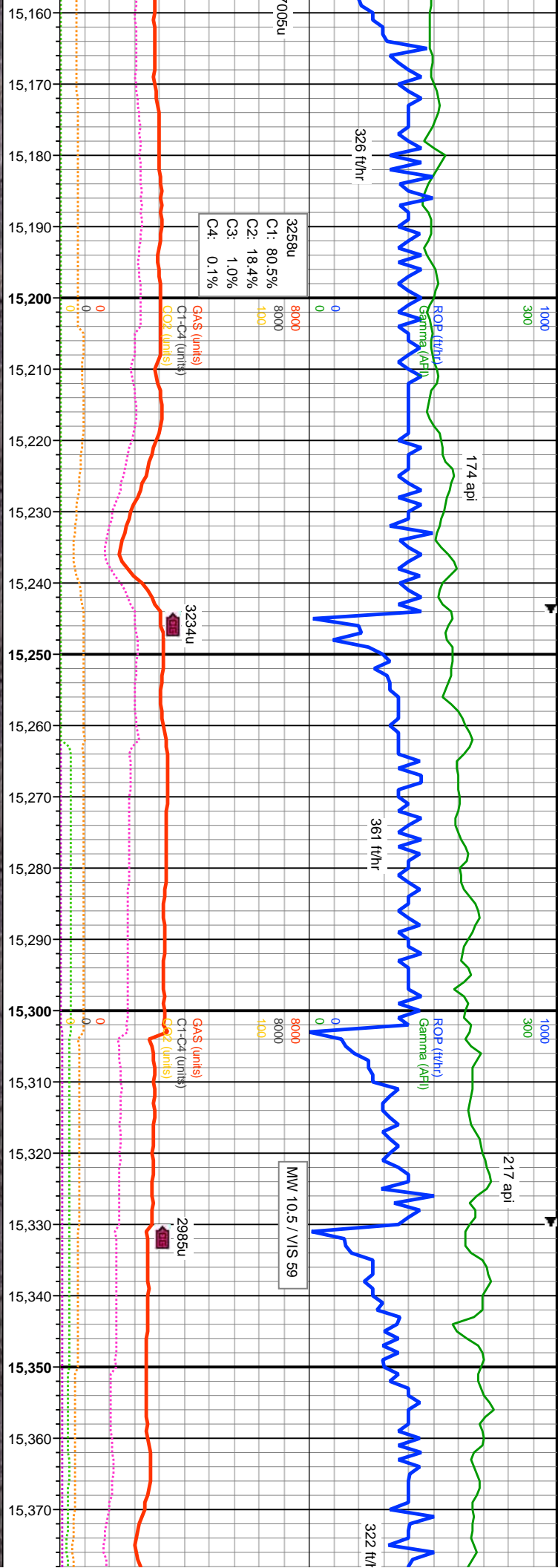








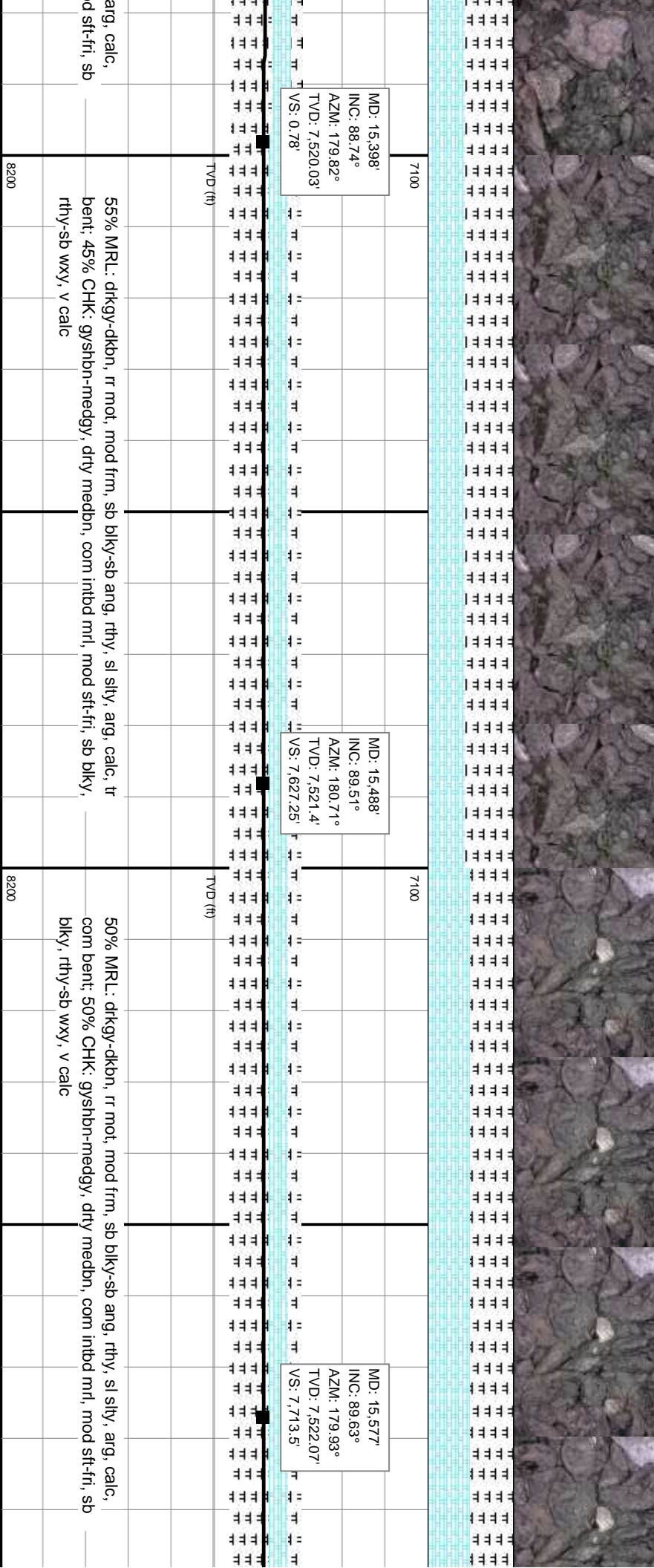
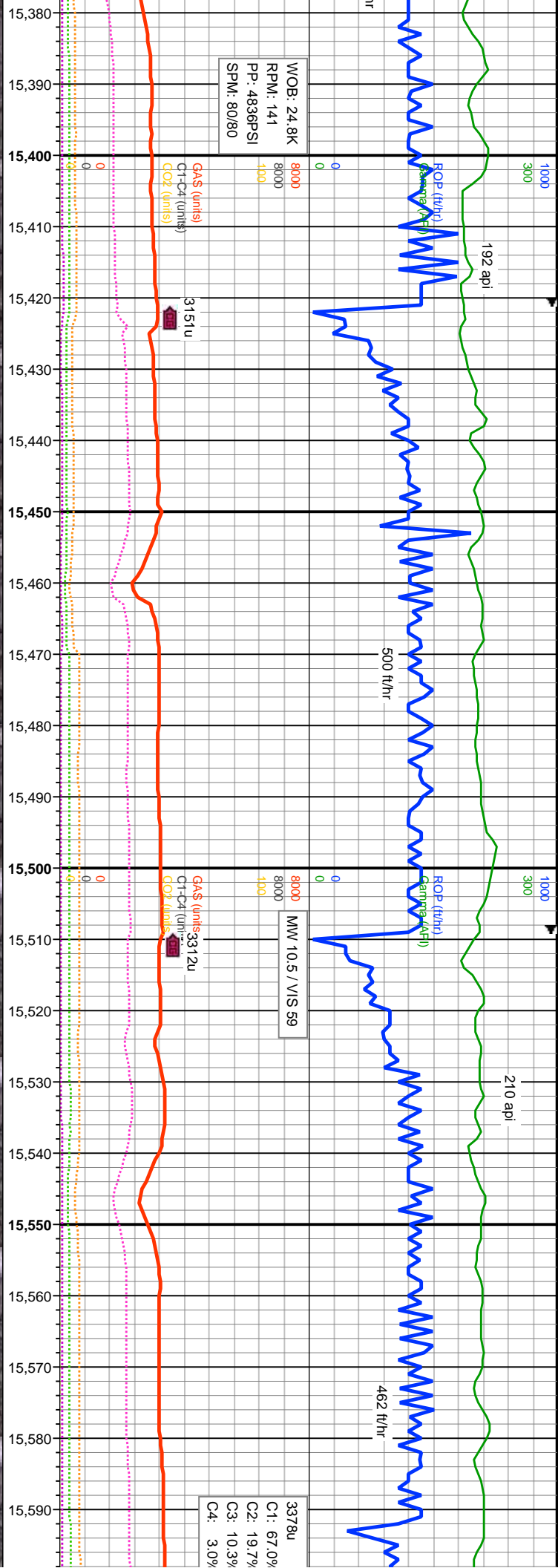


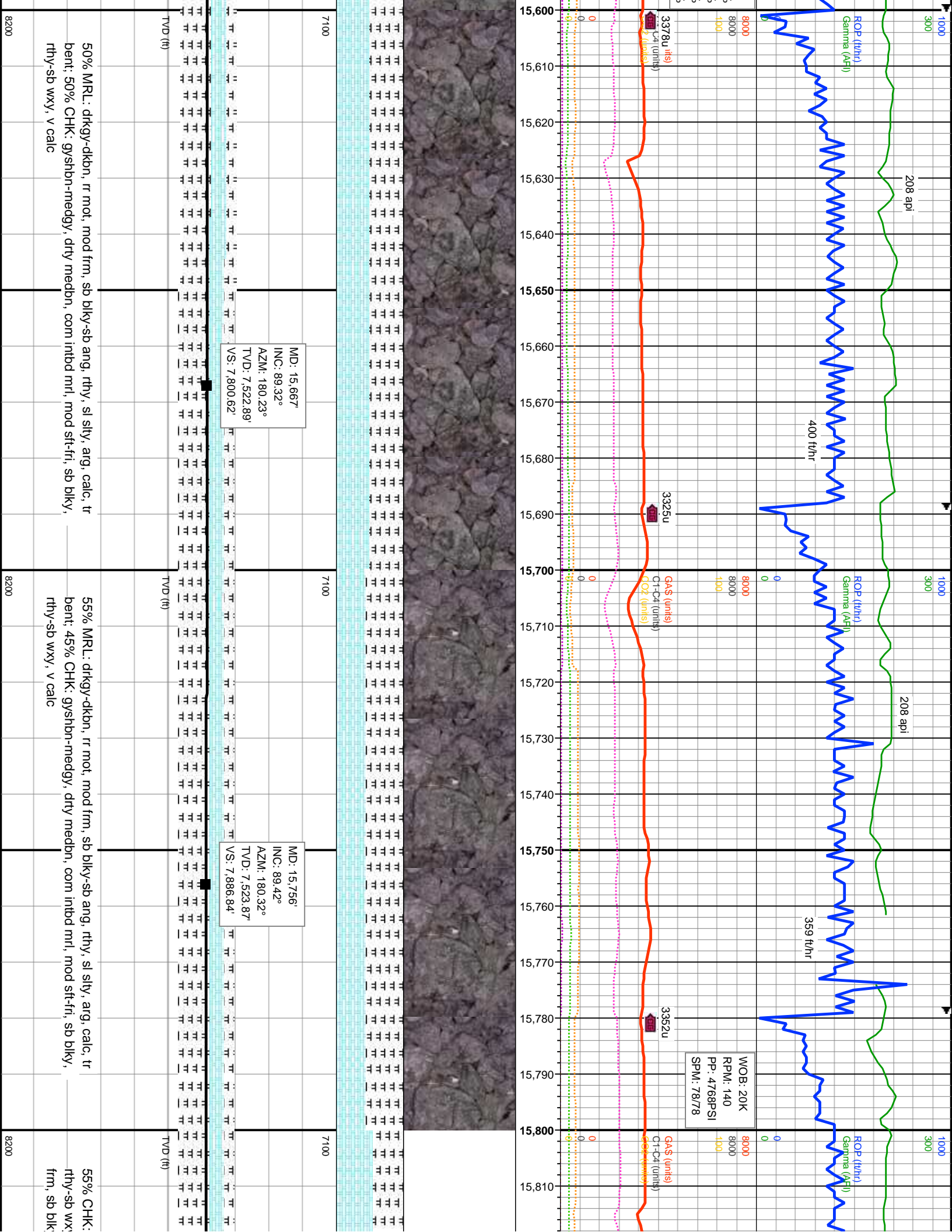


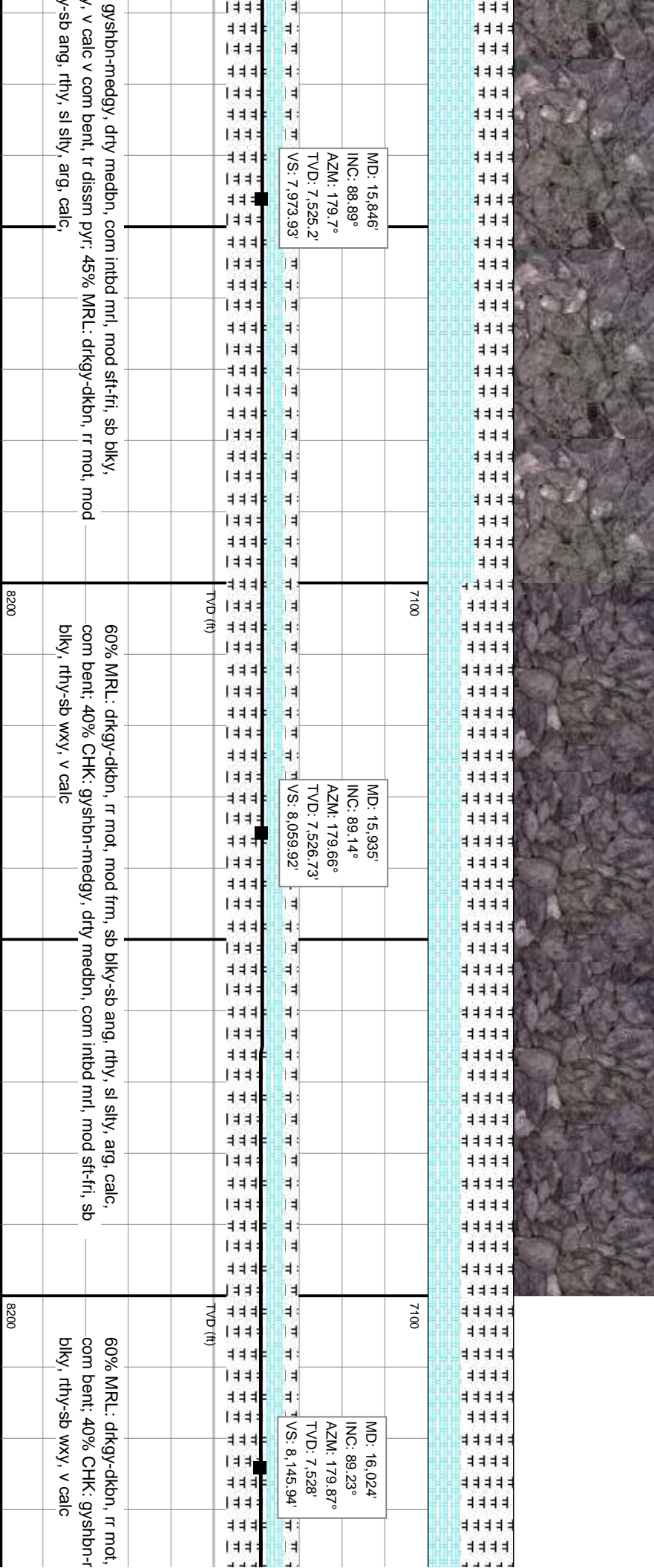
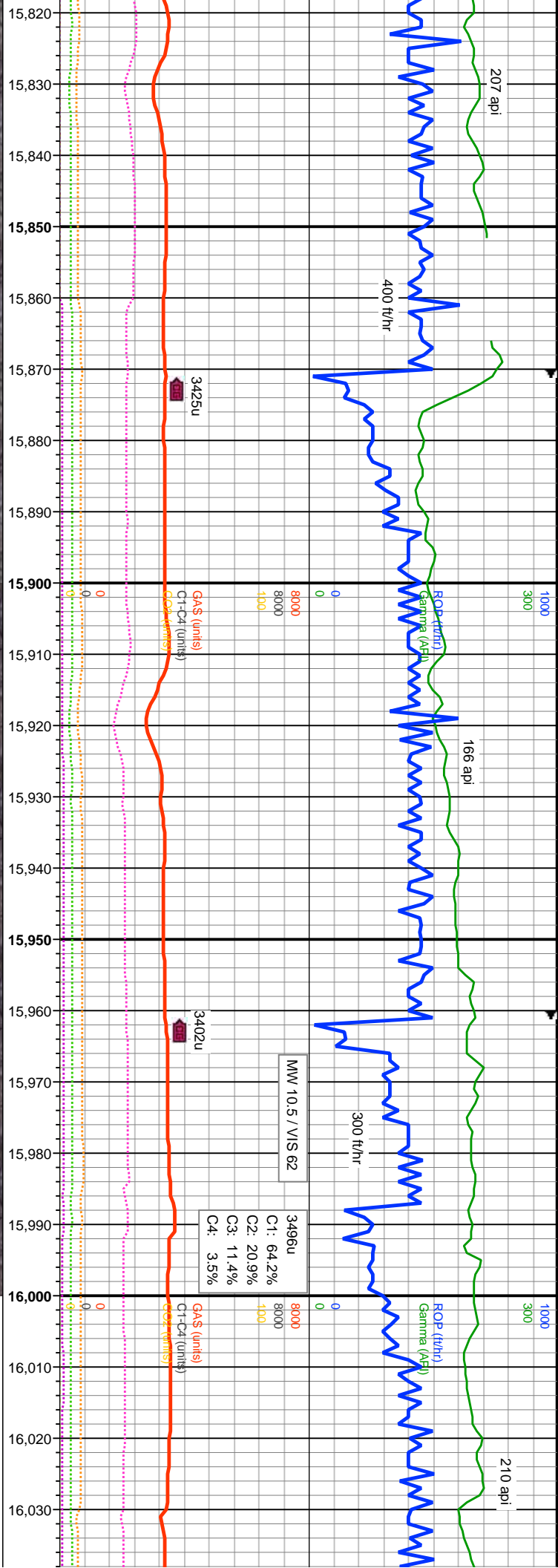
ang, rthy, sl stly, arg, calc, tr
edgy, dtry medbn, com intbd

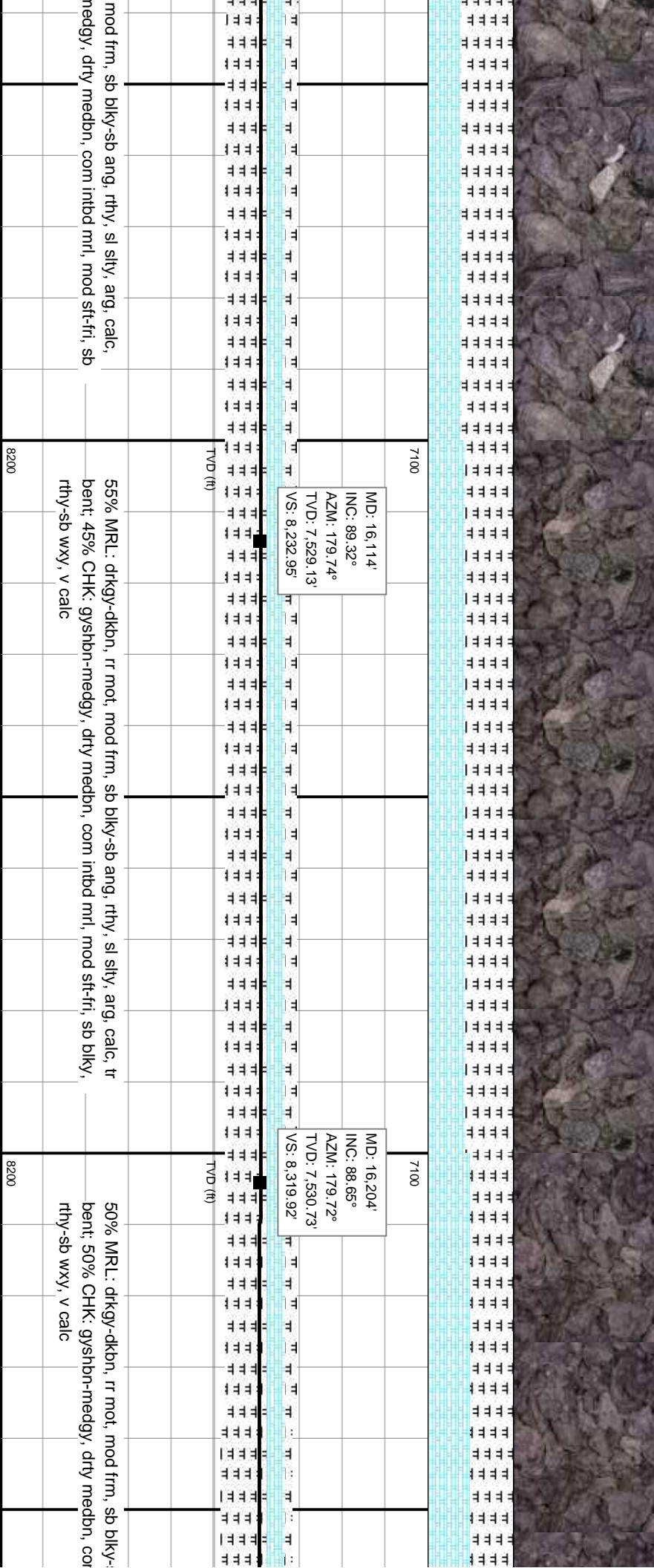
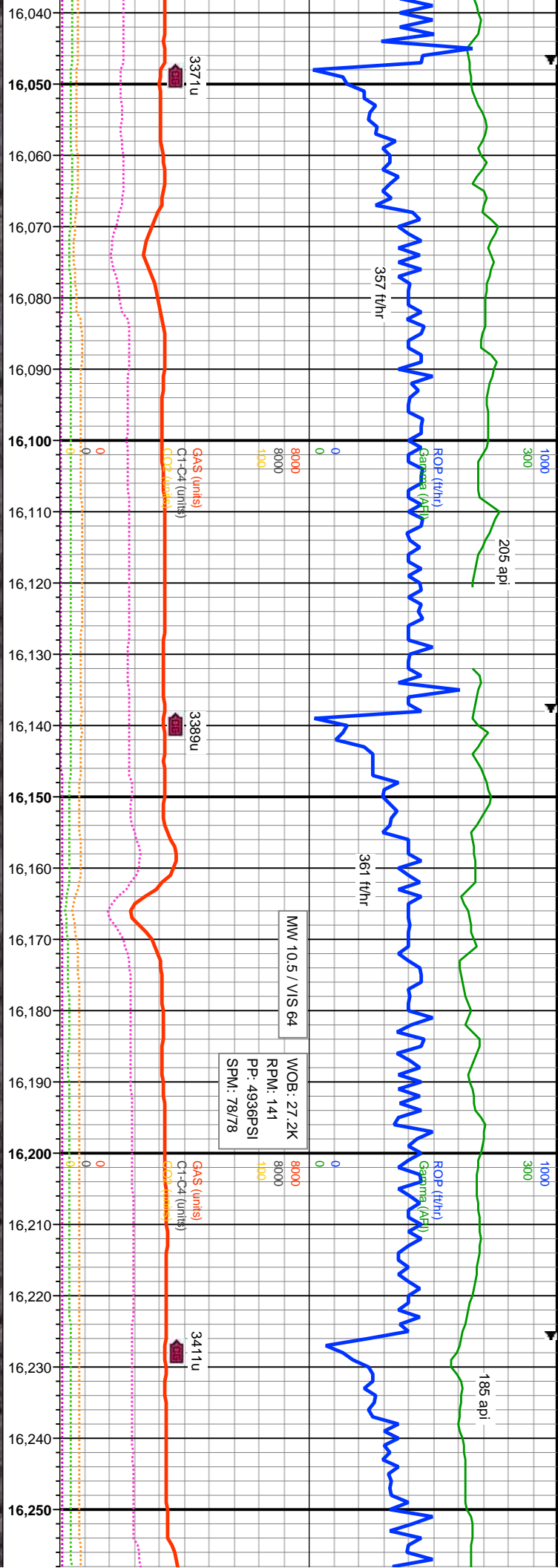
70% MRL: drkgy-dkbn, rr mot, mod frm, sb blkyy-sb ang, rthy, sl stly, arg, calc, tr
bent w intbd pyr, rr nodr pyr, 30% CHK: gysbhn-medgy, dtry medbn, com intbd
mrl, mod sft-frt, sb blkyy, rthy-sb wxy, v calc

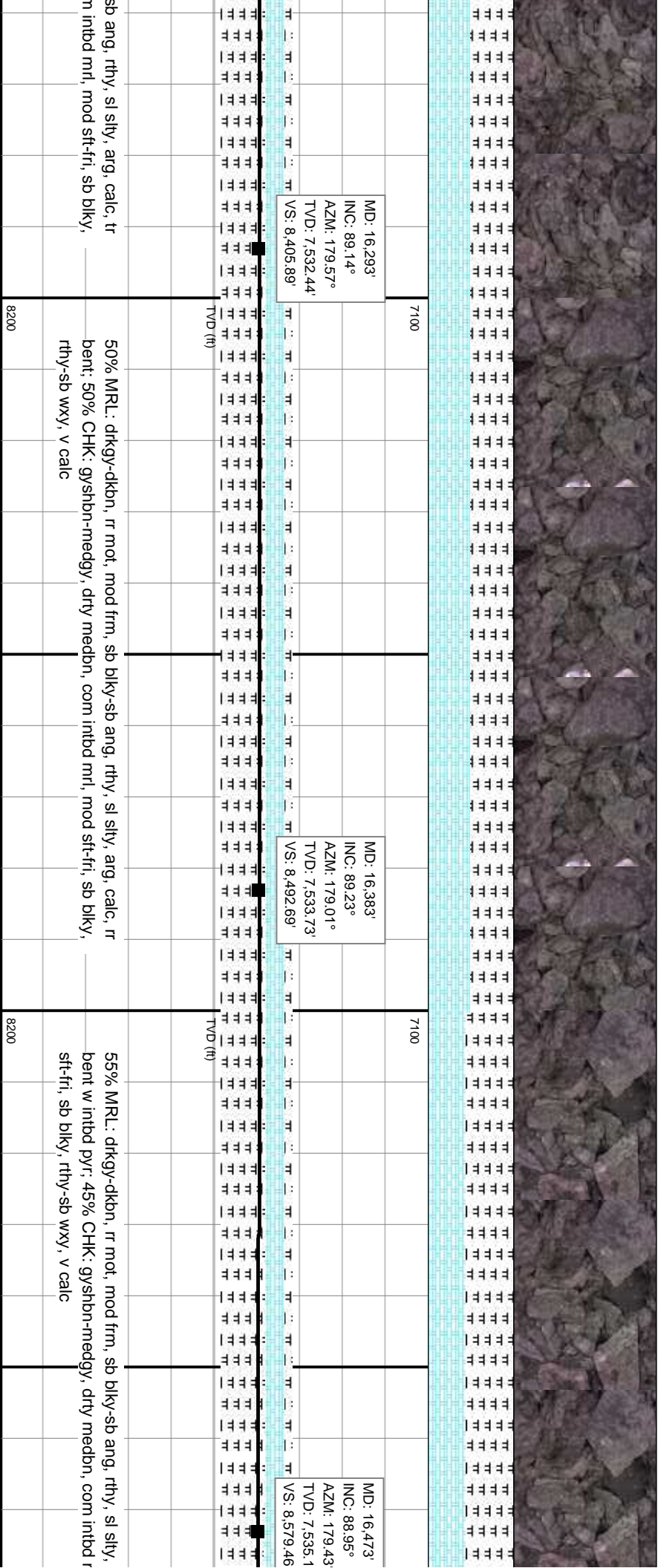
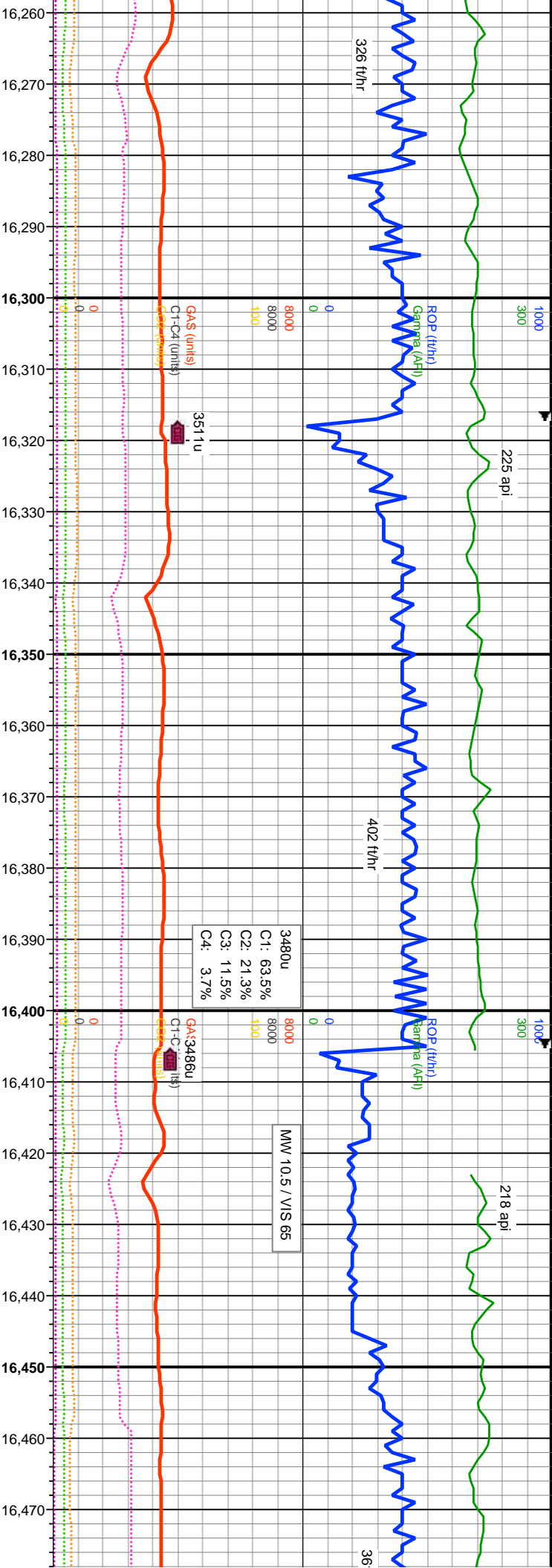
55% MRL: drkgy-dkbn, rr mot, mod frm, sb blkyy-sb ang, rthy, sl stly,
com bent; 45% CHK: gysbhn-medgy, dtry medbn, com intbd mrl, mo
blkyy, rthy-sb wxy, v calc

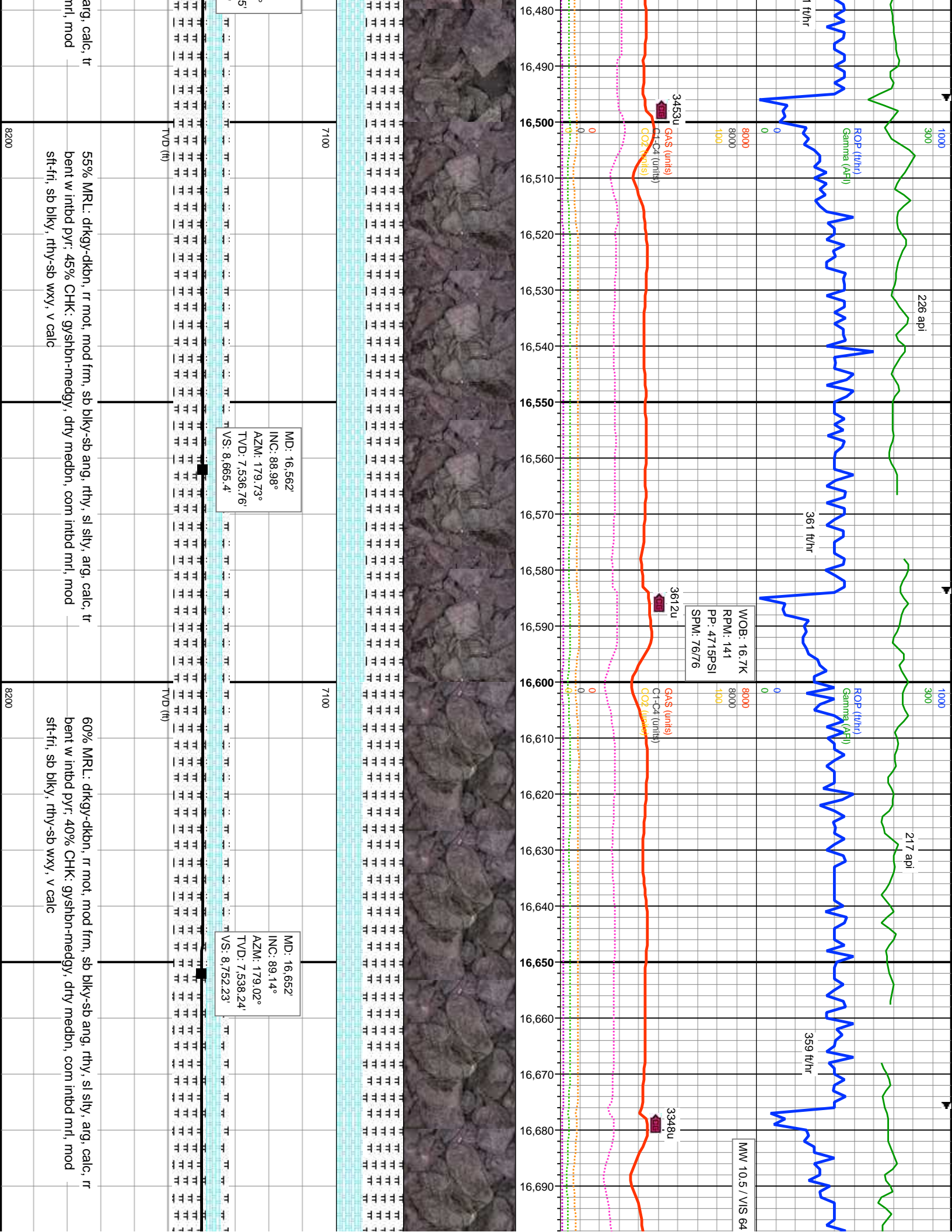












MW 10.5 / VIS 64

WOB: 16.7K
RPM: 141
PP: 4715PSI
SPM: 76/76

3453u
Gas (units)
C1-C4 (units)
CO2 (units)

3612u
Gas (units)
C1-C4 (units)
CO2 (units)

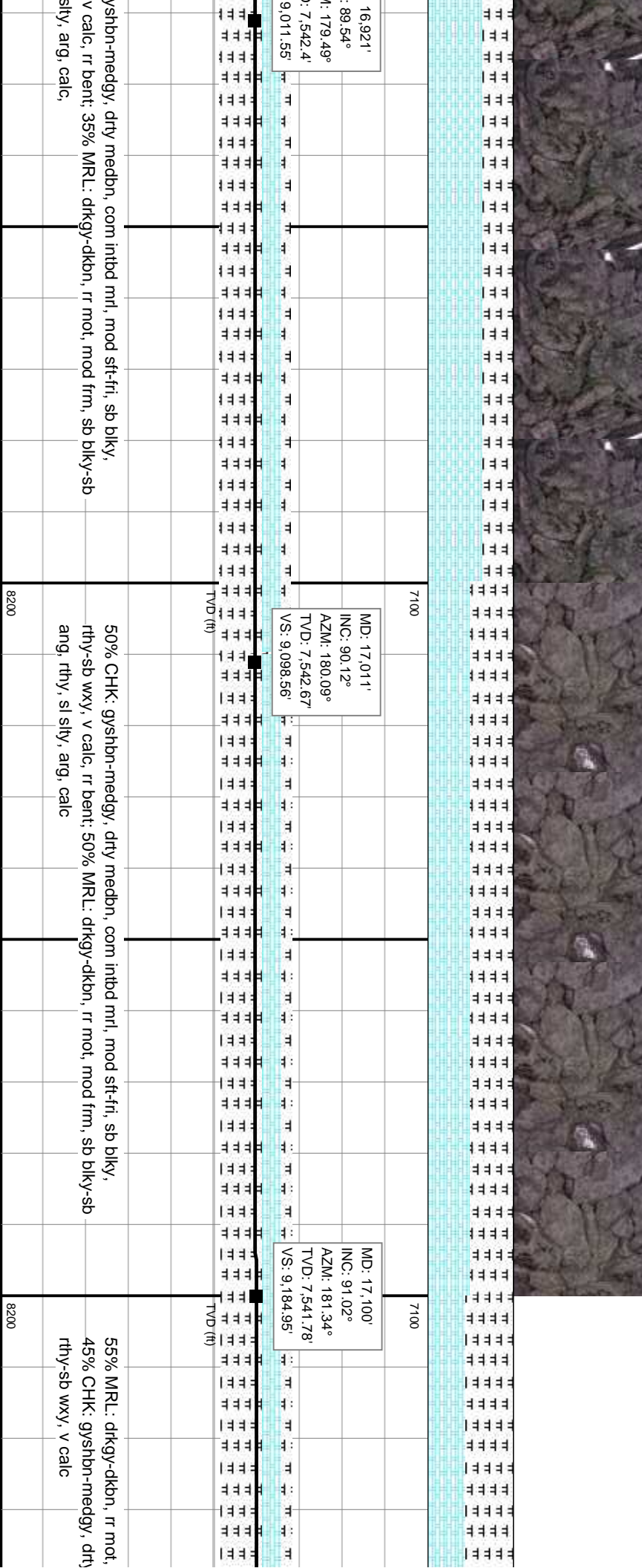
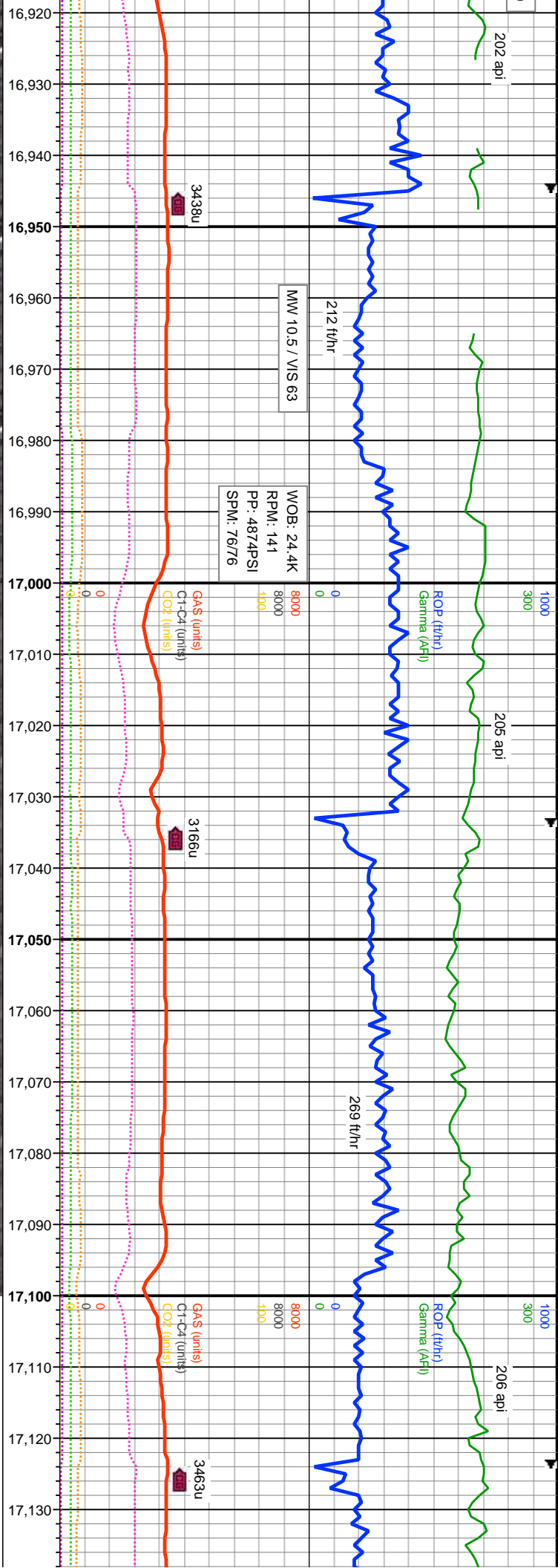
3348u
Gas (units)
C1-C4 (units)
CO2 (units)

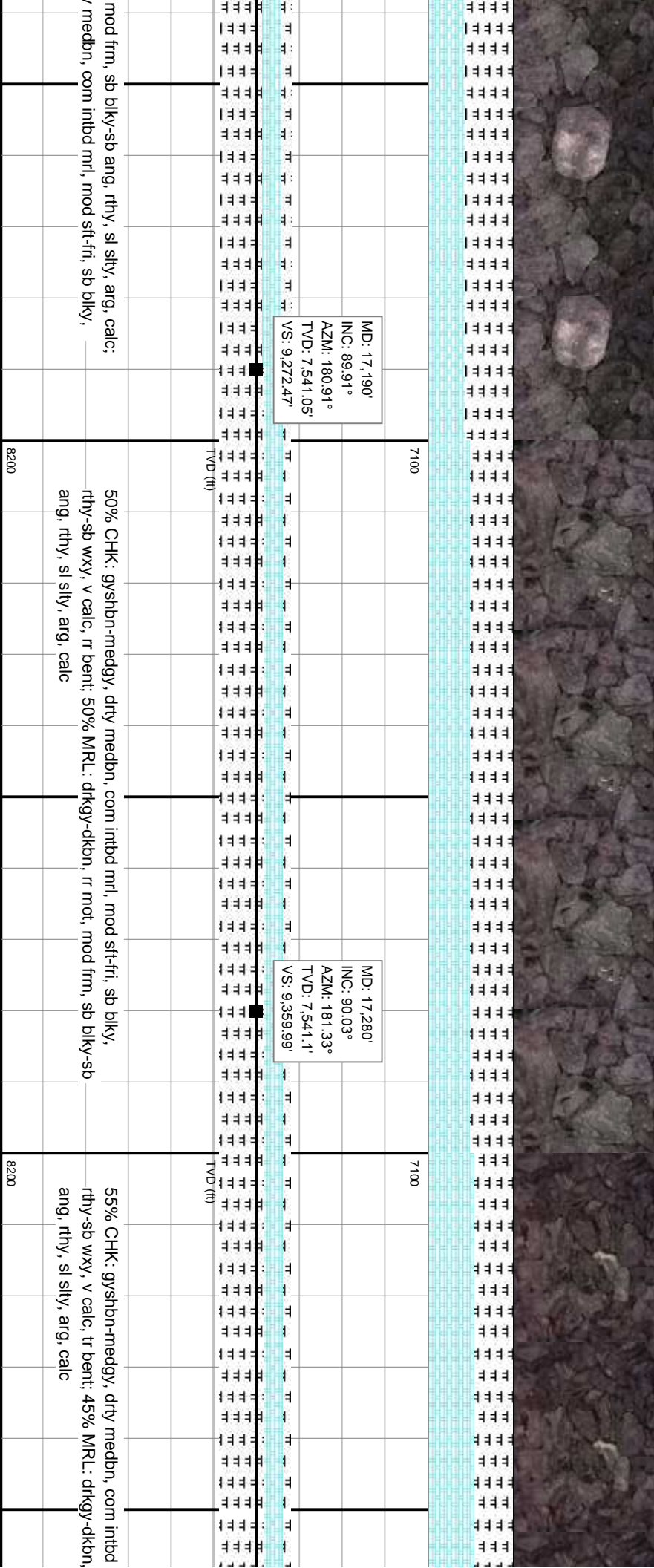
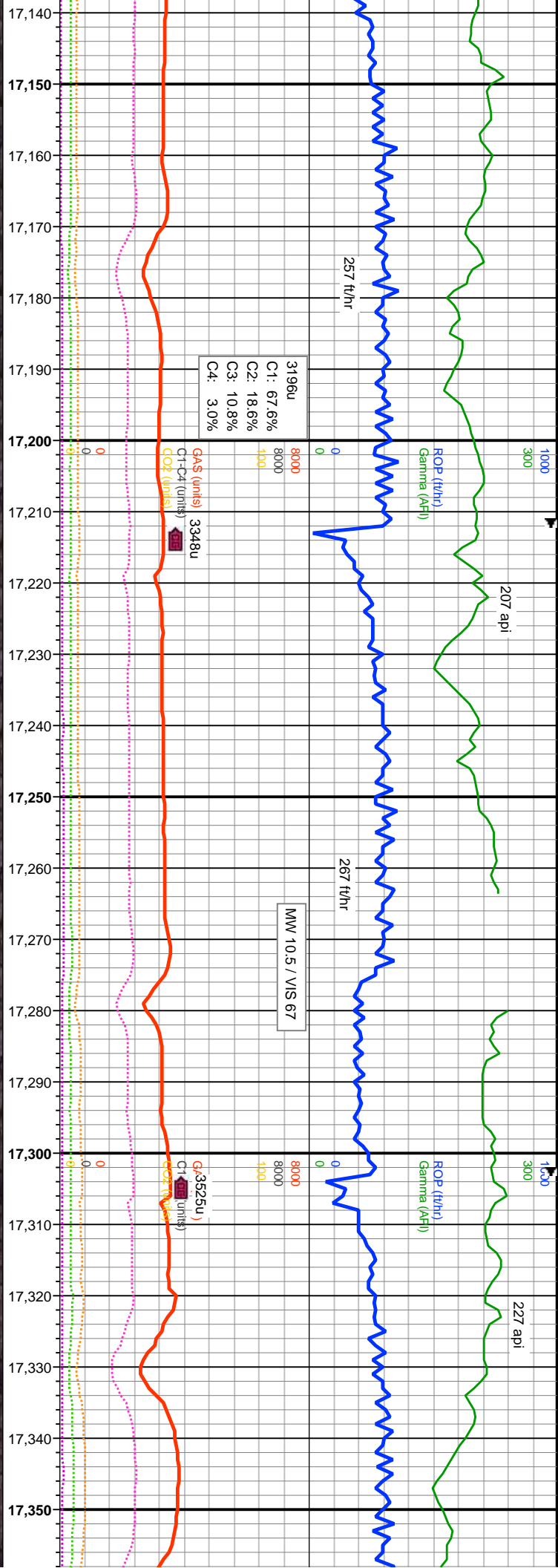
MD: 16.562
INC: 88.98°
AZM: 179.73°
TVD: 7.536.76'
VS: 8.665.4'

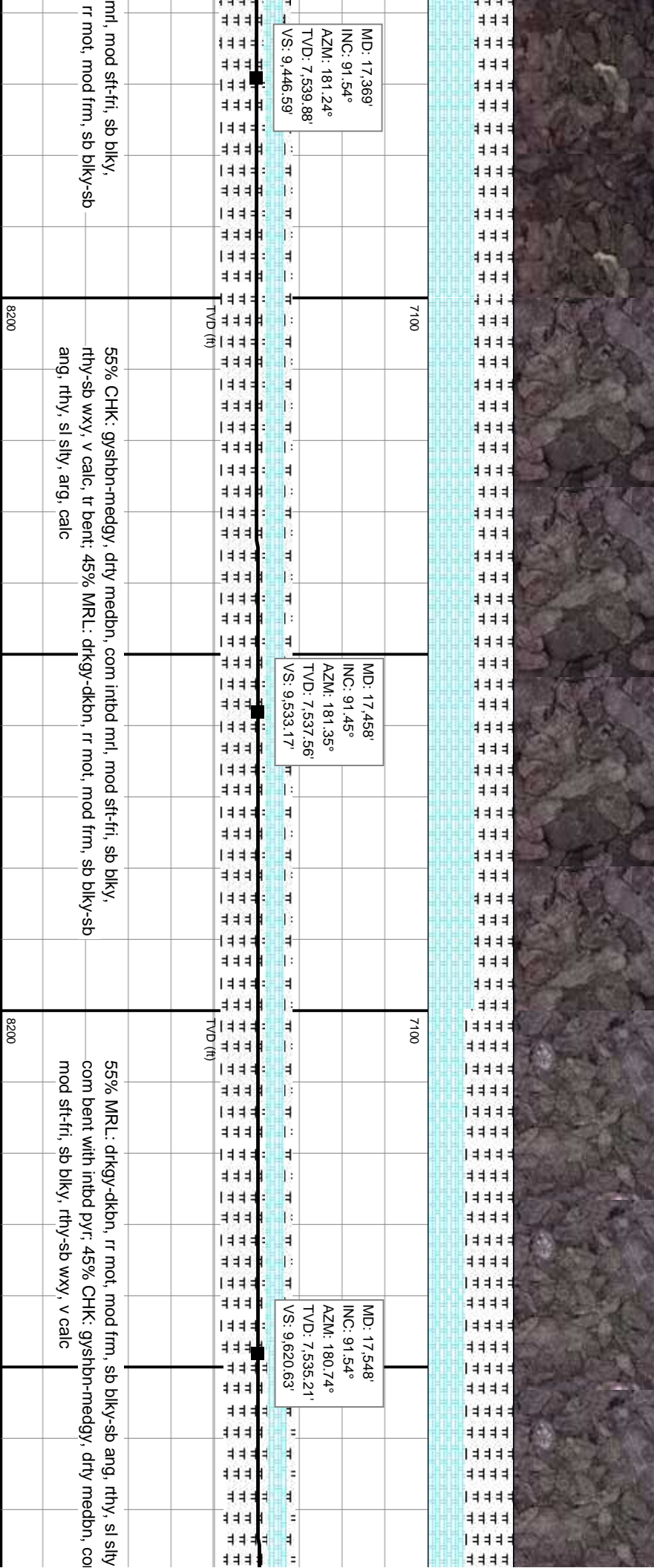
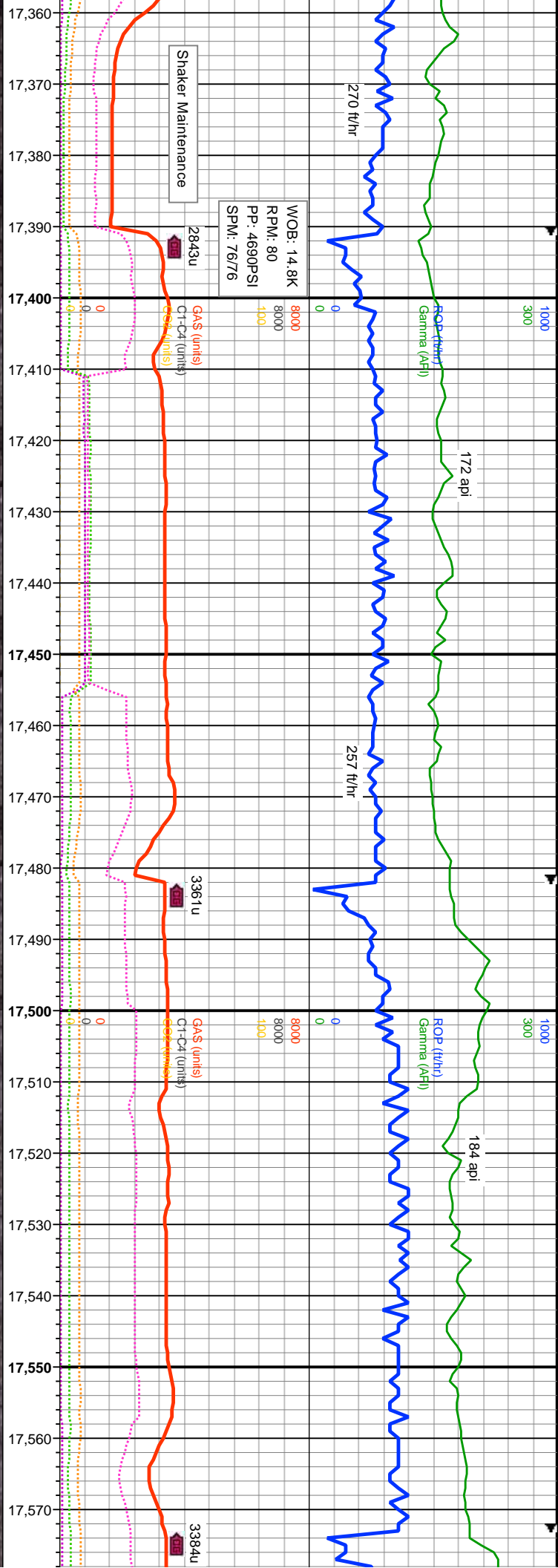
MD: 16.652
INC: 89.14°
AZM: 179.02°
TVD: 7.538.24'
VS: 8.752.23'

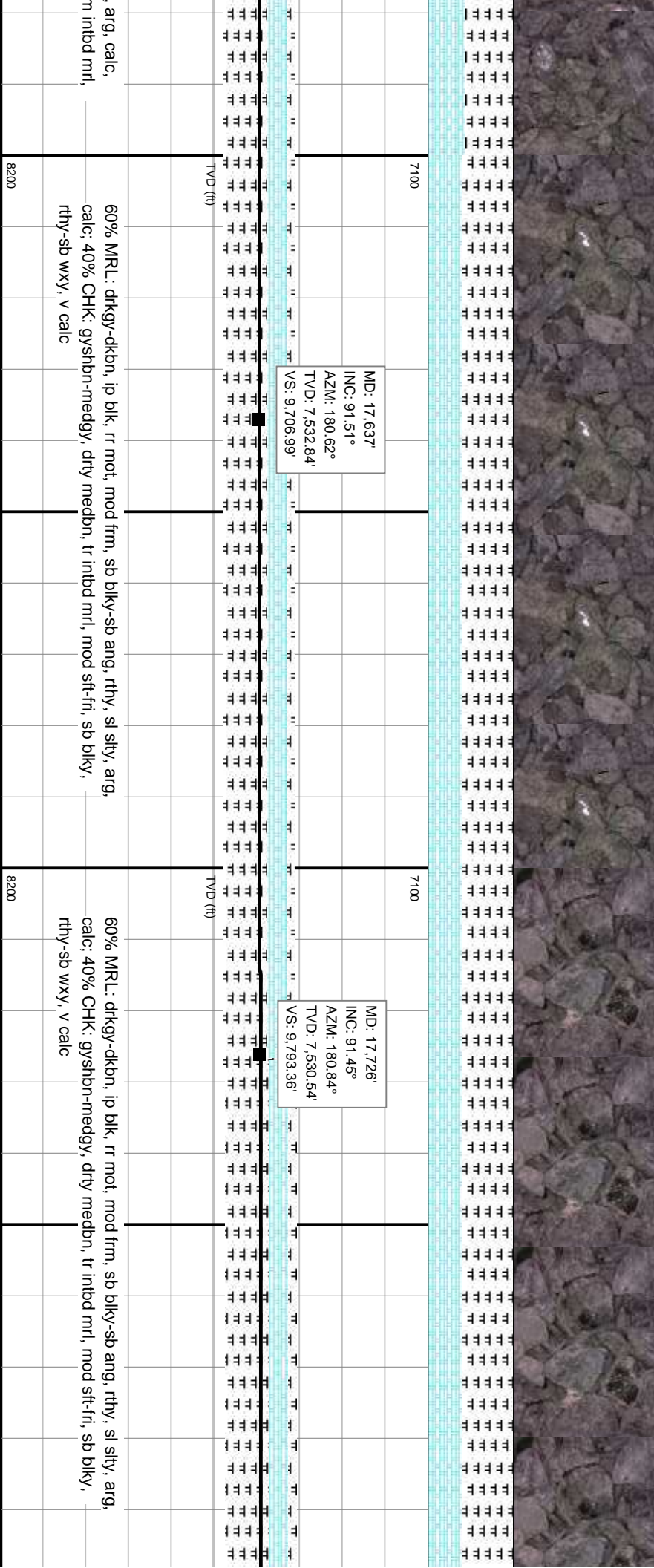
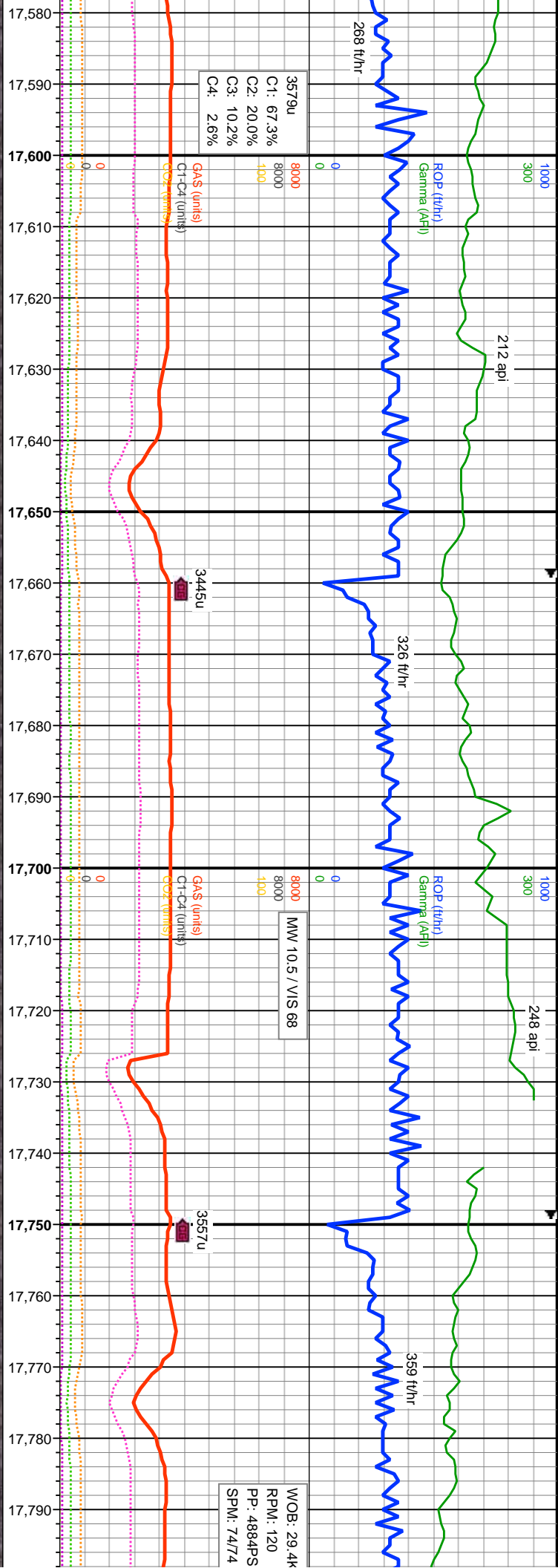
55% MRL: drkg-y-dkbn, r mot, mod frm, sb blk-y-sb ang, rthy, sl silty, arg, calc, tr bent w intbd pyr, 45% CHK: gysbn-medgy, drty medbn, com intbd mrl, mod sft-frt, sb blk-y, rthy-sb wxy, v calc

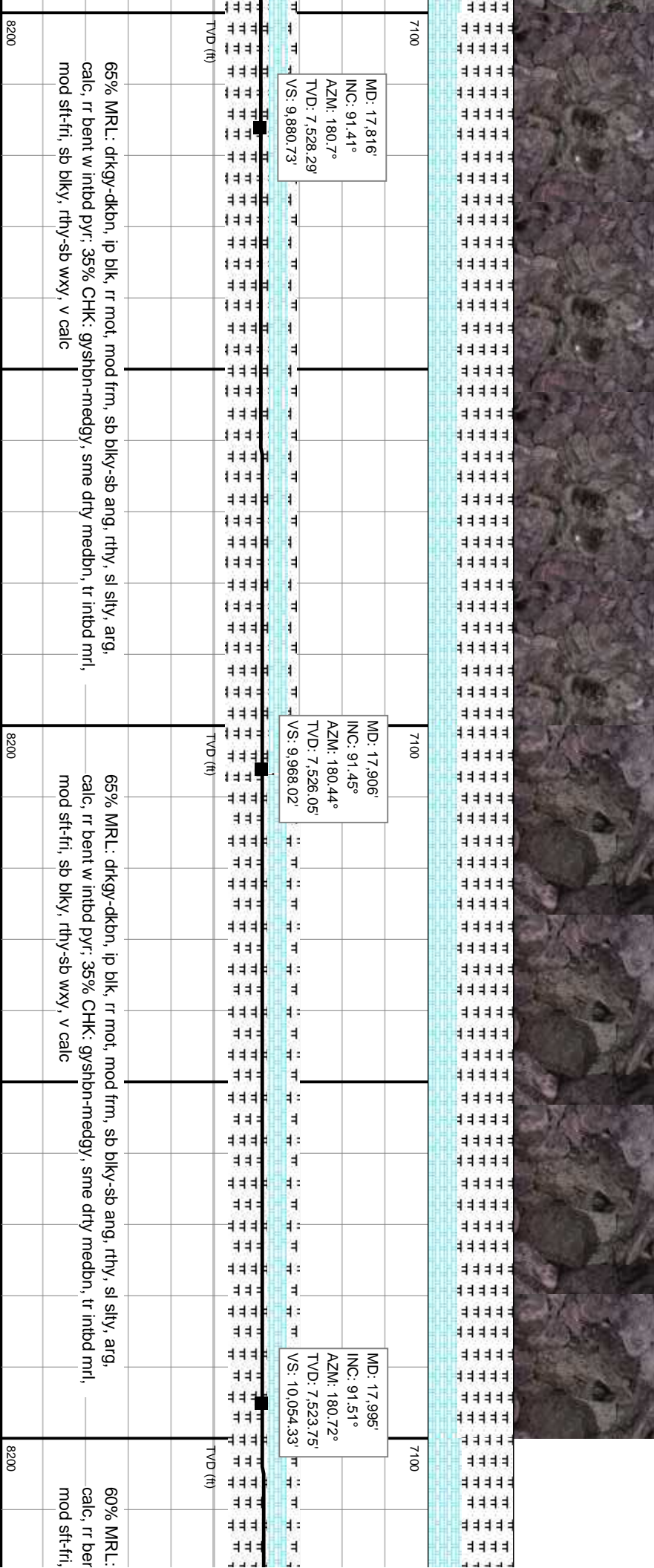
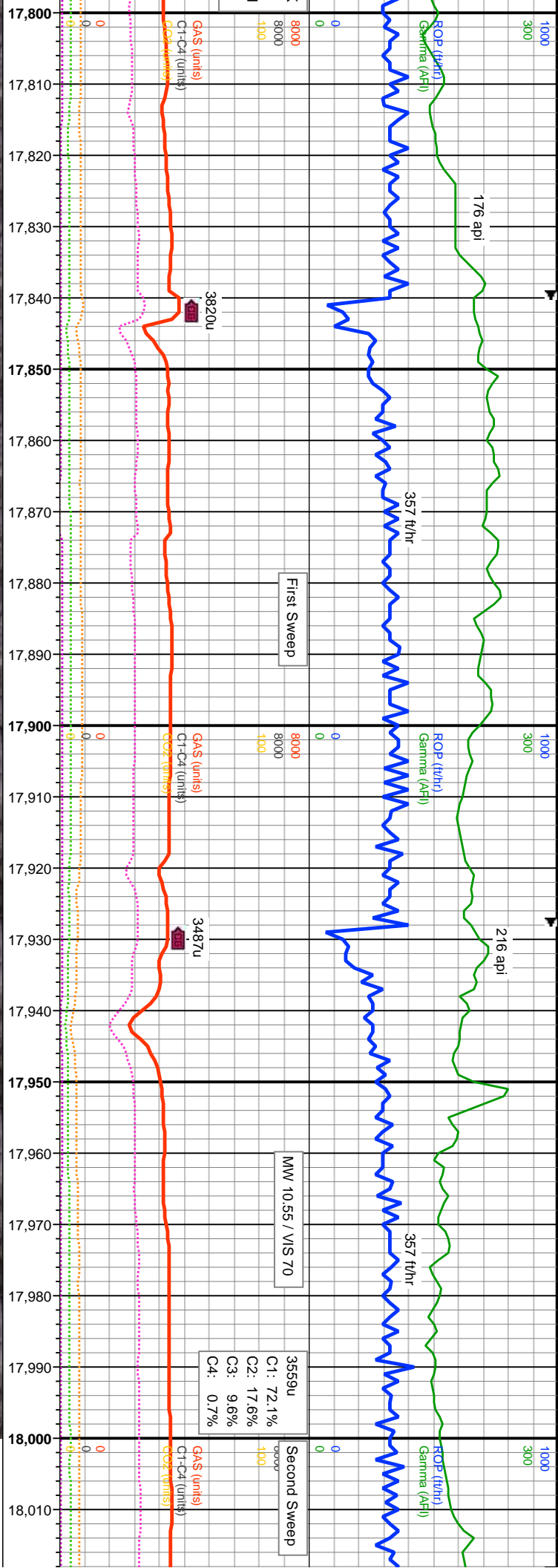
60% MRL: drkg-y-dkbn, r mot, mod frm, sb blk-y-sb ang, rthy, sl silty, arg, calc, tr bent w intbd pyr, 40% CHK: gysbn-medgy, drty medbn, com intbd mrl, mod sft-frt, sb blk-y, rthy-sb wxy, v calc

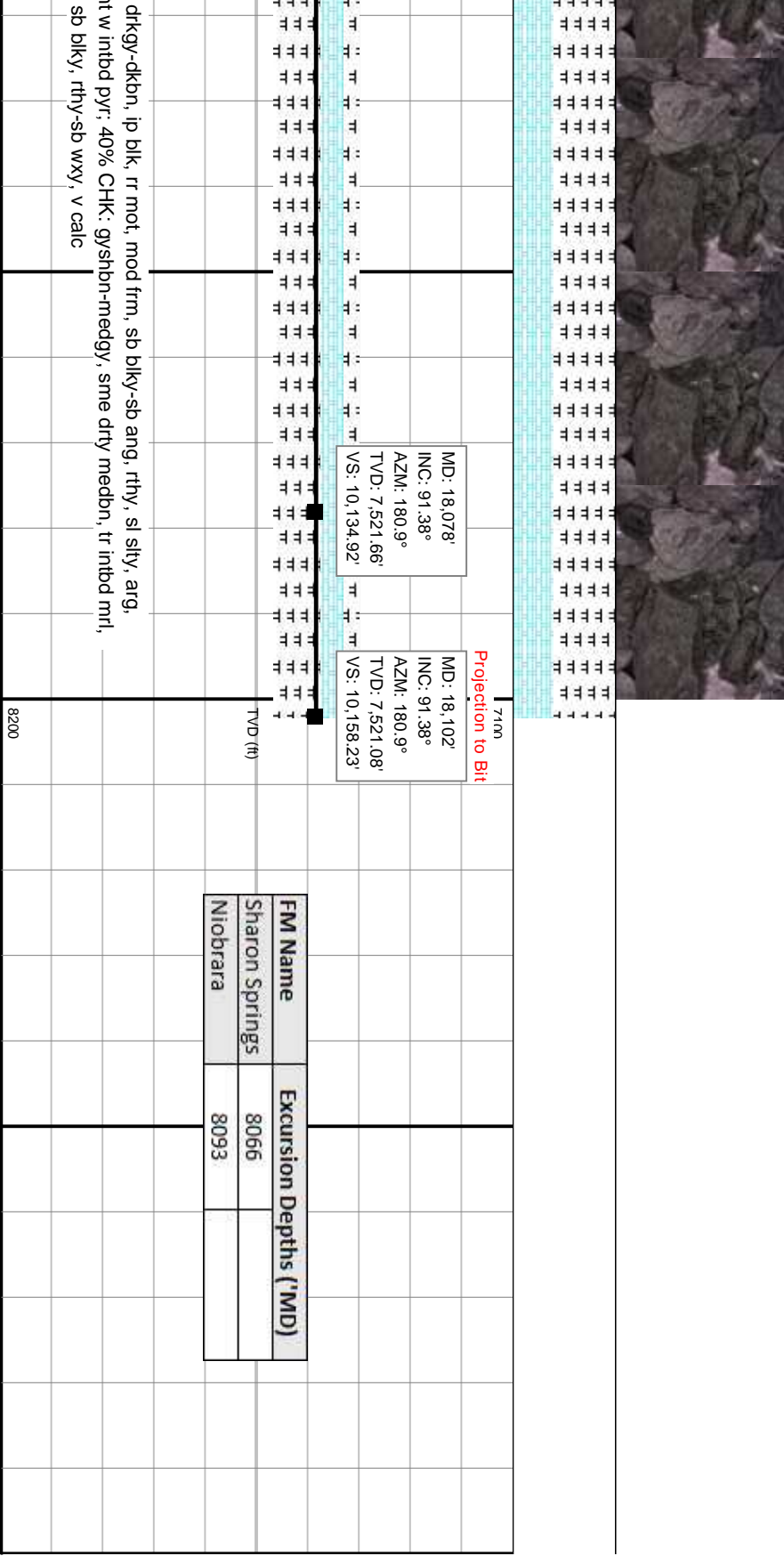
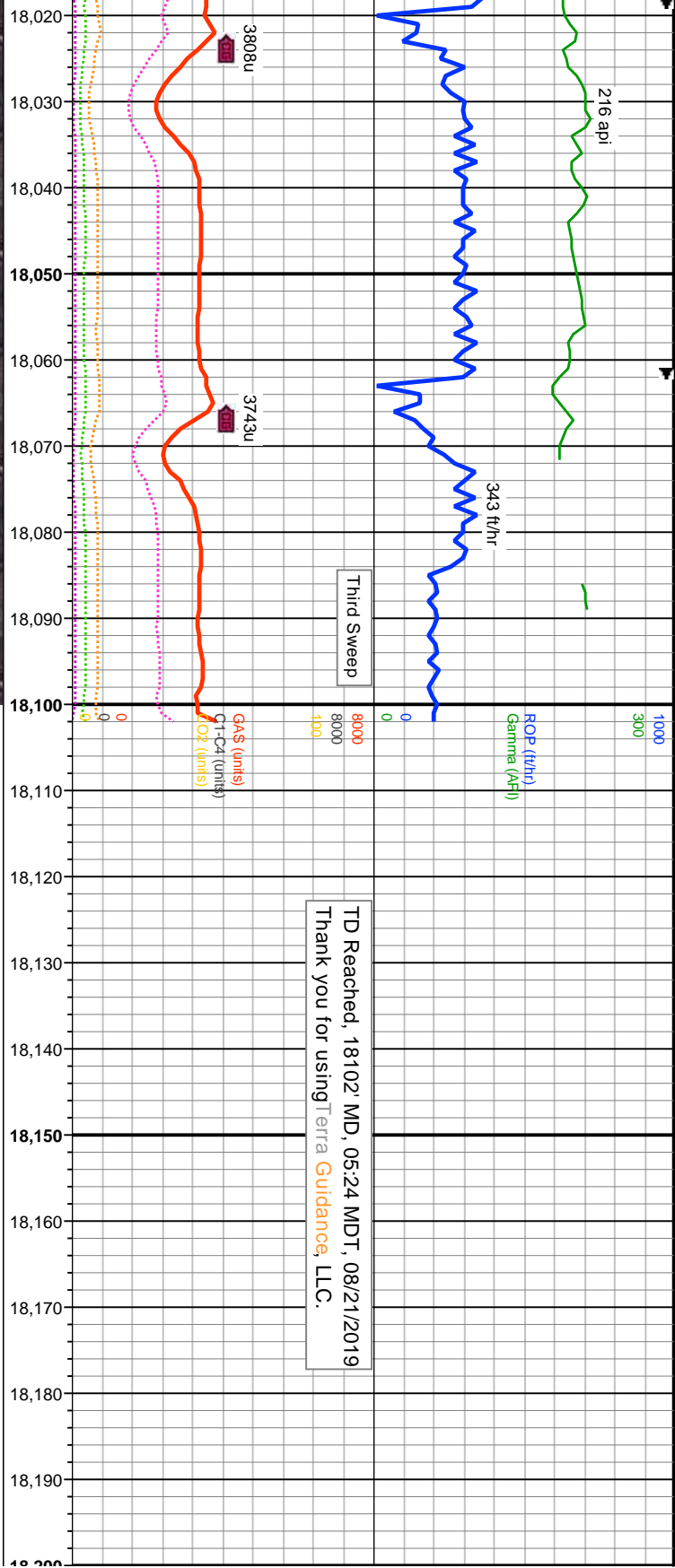












MD: 18,078'
INC: 91.38°
AZM: 180.9°
TVD: 7,521.66'
VS: 10,134.92'

MD: 18,102'
INC: 91.38°
AZM: 180.9°
TVD: 7,521.08'
VS: 10,158.23'

Excursion Depths ('MD)	
Sharon Springs	8066
Niobrara	8093